# DIVAR IP 7000 2U

DIP-7080-00N, DIP-7082-8HD

BOSCH

**en** Installation Manual

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# 1 Safety precautions

Observe the safety precautions in this chapter.

## 1.1 General safety precautions

Follow these rules to ensure general safety:

- Keep the area around the system clean and free of clutter.
- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.
- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.
- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.
- After accessing the inside of the system, close the system back up and secure it to the rack unit after ensuring that all connections have been made.
- The system weighs approximately 57 lbs. (25.9 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

**Warning!**

Interruption of mains supply:
Voltage is applied as soon as the mains plug is inserted into the mains socket.
However, for devices with a mains switch, the device is only ready for operation when the mains switch (ON/OFF) is in the ON position. When the mains plug is pulled out of the socket, the supply of power to the device is completely interrupted.

**Warning!**

Removing the housing:
To avoid electric shock, the housing must only be removed by qualified service personnel. Before removing the housing, the plug must always be removed from the mains socket and remain disconnected while the housing is removed. Servicing must only be carried out by qualified service personnel. The user must not carry out any repairs.

**Warning!**

Power cable and AC adapter:
When installing the product, use the provided or designated connection cables, power cables and AC adaptors. Using any other cables and adaptors could cause a malfunction or a fire. Electrical Appliance and Material Safety Law prohibits the use of UL or CSA-certified cables (that have UL/CSA shown on the code) for any other electrical devices.

**Warning!**

Lithium battery:

Batteries that have been inserted wrongly can cause an explosion. Always replace empty batteries with batteries of the same type or a similar type recommended by the manufacturer. Handle used batteries carefully. Do not damage the battery in any way. A damaged battery may release hazardous materials into the environment.

Dispose of empty batteries according to the manufacturer's instructions.

**Warning!**

Handling of lead solder materials used in this product may expose you to lead, a chemical known to the State of California to cause birth defects and other reproductive harm.

**Notice!**

Electrostatically sensitive device:

To avoid electrostatic discharges, the CMOS/MOSFET protection measures must be carried out correctly.

When handling electrostatically sensitive printed circuits, grounded anti-static wrist bands must be worn and the ESD safety precautions observed.

**Notice!**

Installation should only be carried out by qualified customer service personnel in accordance with the applicable electrical regulations.

**Disposal**

Your Bosch product has been developed and manufactured using high-quality materials and components that can be reused.

This symbol means that electronic and electrical devices that have reached the end of their working life must be disposed of separately from household waste.

In the EU, separate collecting systems are already in place for used electrical and electronic products. Please dispose of these devices at your local communal waste collection point or at a recycling center.

## 1.2 Electrical safety precautions

Basic electrical safety precautions should be followed to protect you from harm and the system from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.
- Do not work alone when working with high voltage components.
- Power should always be disconnected from the system when removing or installing main system components, such as the motherboard or memory modules. When disconnecting power, you should first turn off the system and then unplug the power cords from all the power supply modules in the system.
- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.
- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets. The unit has more than one power supply cord. Disconnect both power supply cords before servicing to avoid electrical shock.
- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

**Caution!**
Mainboard Battery: There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities. This battery must be replaced only with the same or an equivalent type recommended by the manufacturer (CR2032). Dispose of used batteries according to the manufacturer's instructions.

**Caution!**
DVD-ROM Laser: This system comes without a DVD-ROM drive but if added: To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

## 1.3 ESD precautions

Electrostatic Discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Do not use mats designed to decrease electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.
- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or printed circuit boards come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only. Do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the mainboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the mainboard.

## 1.4 Operating precautions

The chassis cover must be in place when the system is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

**Note:**
Please handle used batteries carefully. Do not damage the battery in any way. A damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

## 1.5 Important notices

| | |
|---|---|
| | **Accessories** - Do not place this unit on an unstable stand, tripod, bracket, or mount. The unit may fall, causing serious injury and/or serious damage to the unit. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer. When a cart is used, use caution and care when moving the cart/apparatus combination to avoid injury from tip-over. Quick stops, excessive force, or uneven surfaces may cause the cart/unit combination to overturn. Mount the unit per the manufacturer's instructions. |

## 1.6 FCC and ICES compliance

(only for U.S.A. and Canada)
This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer’s instruction manual, may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

# 2 System overview

DIVAR IP 7000 is an affordable, simple and reliable all-in-one recording, viewing and management solution for network surveillance systems of up to 64 channels (with 32 channels pre-licensed). Running the full Bosch VMS (Video Management System) solution and powered by Bosch VRM (Video Recording Manager) software, the DIVAR IP 7000 is an intelligent IP storage device that eliminates the need for separate NVR (Network Video Recorder) server and storage hardware.

The 2U rack mount unit combines advanced management and state-of-the-art recording management into a single cost-effective, plug and play IP recording appliance for IT-minded customers which are seeking for a state-of-the-art “second generation” NVR recording solution.

DIVAR IP 7000 features:

– Instant real time access to video
  View high quality HD video despite low or limited bandwidth connections. Dynamic Transcoding technology ensures that you can view your video immediately — anytime, anywhere.
– Easy installation
  DIVAR IP 7000 2U features wizard based set-up and centralized configuration to reduce installation times. All components are pre-installed and pre-configured. Simply connect to the network and turn on the unit — DIVAR IP 7000 2U starts recording straight out of the box.
– Access to Bosch VMS
  After starting the system, immediate access to the Bosch VMS management application is offered by a customized user interface. The ability to use one central user interface for configuration and operation management reduces installation and training requirements, and helps to keep ongoing system management costs low.

## 2.1 Chassis features

The chassis includes the following features:

– CPU (Intel QuadCore)
– Internal SSD (80 GB) for operating system and application operations
– 8 slots for U320 SCSI or SAS/SATA drives. These drives are hot swappable. Once setup correctly, these drives can be removed without powering down the server. In addition, these drives support SAF-TE (SCSI) and SES2 (SAS/SATA)
– Seven low-profile I/O expansion slots.
– Graphic card AMD V3900 (1x DVI, 1x Display Port output)
– Sound card
– One slim DVD-RW drive and one slim Floppy Drive. These drives allow you to quickly install or save data.
– One internal USB Transcoder device
  Other onboard features are included to promote system health. These include various cooling fans, a convenient power switch, reset button, and LED indicators.

## 2.2 Chassis components

This chapter describes the most common components included with your chassis. For more information, see the installation instructions detailed later in this manual.

### 2.2.1 Chassis

The chassis includes 8 hard drive bays and supports a 2U backplane, 3 fans and two power supplies.

### 2.2.2 Backplane

Each chassis comes with a 2U backplane. The backplane accepts SAS/SATA hard drives.

**Warning!**

Use caution when servicing and working around the backplane. Hazardous voltage or energy is present on the backplane when the system is operating. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane.

### 2.2.3 Fans

The chassis supports 3 system fans that are powered from the motherboard. These fans are 2U high and are powered by 3-pin connectors.

### 2.2.4 Mounting rails

The unit can be placed in a rack for secure storage and use. To setup your rack, follow the step-by-step instructions included in this manual.

### 2.2.5 Power supply

Each chassis model includes 2 high-efficiency power supplies (redundant). In the unlikely event your power supply fails, replacement is simple and can be accomplished without tools.

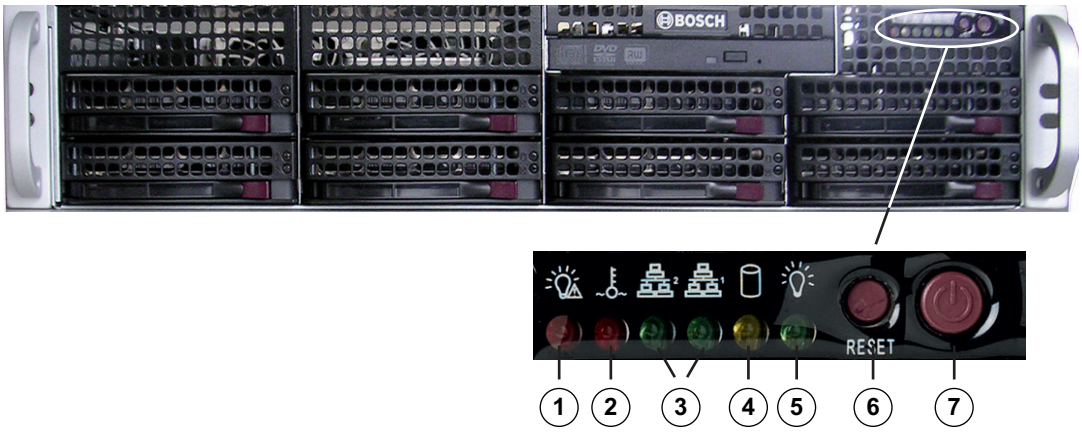
### 2.2.6 Air shroud

Air shrouds are shields, usually plastic, which conduct the airflow directly to where it is needed. Always use the air shroud included with your chassis.

## 2.3 System interface

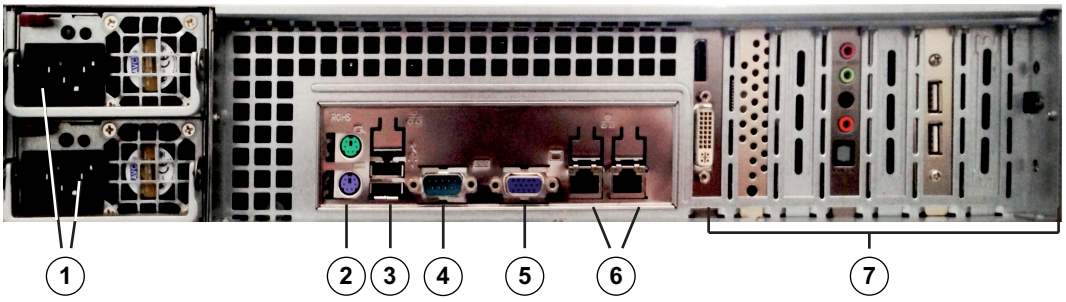
There are several LEDs on the front and rear of the chassis. The LEDs show the over-all status of the system and the activity and health of specific components.

**Front view:**




| | | | |
|---|---|---|---|
| **1** | Power Failure | **5** | Power |
| **2** | Overheat/Fan Fail | **6** | Reset |
| **3** | NIC1/NIC2 | **7** | Power on/off |
| **4** | HDD | | |

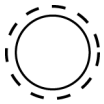
**Rear view:**




| | | | |
|---|---|---|---|
| **1** | 2x mains connection 100 – 240 VAC, 50 - 60 Hz | **5** | Monitor (VGA)<br>**Note:**<br>Do not use! |
| **2** | 2x PS/2 (mouse and keyboard) | **6** | 2x NIC |
| **3** | 2x USB | **7** | Slots for:<br>– 1x graphic card (1x Display Port, 1x DVI) – DVI port must be used for configuration<br>– 1x sound card<br>– 2x USB 2.0 |
| **4** | Serial interface COM1 | | |

## 2.3.1 Control panel buttons

There are two push-buttons located on the front of the chassis. These are (in order from left to right) a reset button and a power on/off button.

–  **Reset**: The reset button is used to reboot the system.

– **Power:** The main power switch is used to apply or remove power from the power supply to the server system. Turning off system power with this button removes the main power but keeps standby power supplied to the system. **Therefore, you must unplug system before servicing.**

## 2.3.2 Control panel LEDs

The control panel located on the front of the chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates and any corrective action you may need to take.

– **Power failure**: A flashing LED indicates a power failure in the power supply.

– **Overheat/fan fail**: A flashing LED indicates a fan failure.
When continuously on (not flashing) the LED indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heat sinks are installed properly.
This LED will remain flashing or on as long as the fan failure/overheat condition exists.

– **NiC2**: A flashing LED indicates network activity on GLAN2.

– **NIC1**: A flashing LED indicates network activity on GLAN1.

– **HDD**: A flashing LED indicates IDE channel activity in the SAS/SATA drive, SCSI drive, and/or DVD-ROM drive activity.

– **Power**: Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

## 2.3.3 Drive carrier LEDs

Your chassis uses SAS/SATA.

**SAS/SATA drives**

Each SAS/SATA drive carrier has two LEDs.

- **Green**: Each Serial ATA drive carrier has a green LED. When illuminated, this green LED (on the front of the SATA drive carrier) indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed.
- **Red**: The red LED indicates a SAS/SATA drive failure. If one of the SAS/SATA drives fail, you should be notified by your system management software.

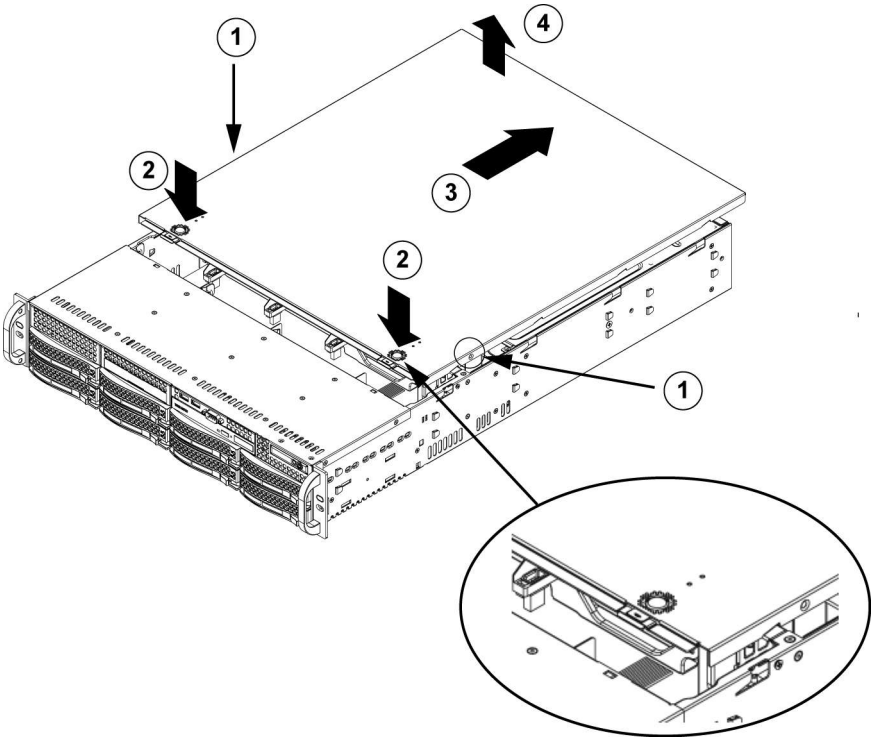
# 3 Chassis setup and maintenance

This chapter covers the steps required to install components and perform maintenance on the chassis.

**Caution!**
Review the warnings and precautions listed in the manual before setting up or servicing this chassis.

**See also:**
- *Safety precautions, page 5*
- *Rack precautions, page 24*
- *General system precautions, page 25*

## 3.1 Removing the chassis cover




**To remove the chassis cover:**
1. Remove the two screws on each side of the cover, which secure the cover to the chassis.
2. Press the release tabs to remove the cover from the locked position. Press both tabs at the same time.
3. Once the top cover is released from the locked position, slide the cover toward the rear of the chassis.
4. Lift the cover off the chassis.

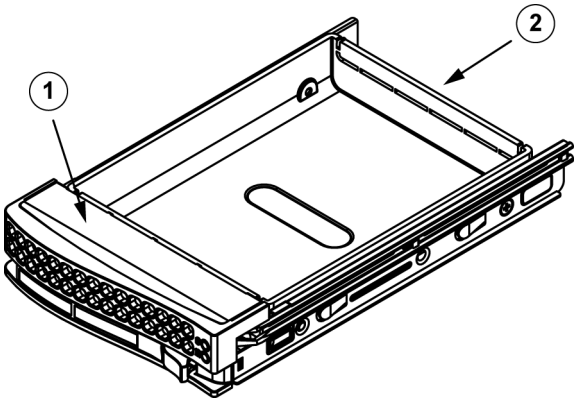
**Notice!**
Except for short periods of time, do NOT operate the server without the cover in place. The chassis cover must be in place to allow proper airflow and prevent overheating.

## 3.2 Installing hard drives

This chapter describes the removing and installing of hard drives.

### 3.2.1 Removing hard drive trays

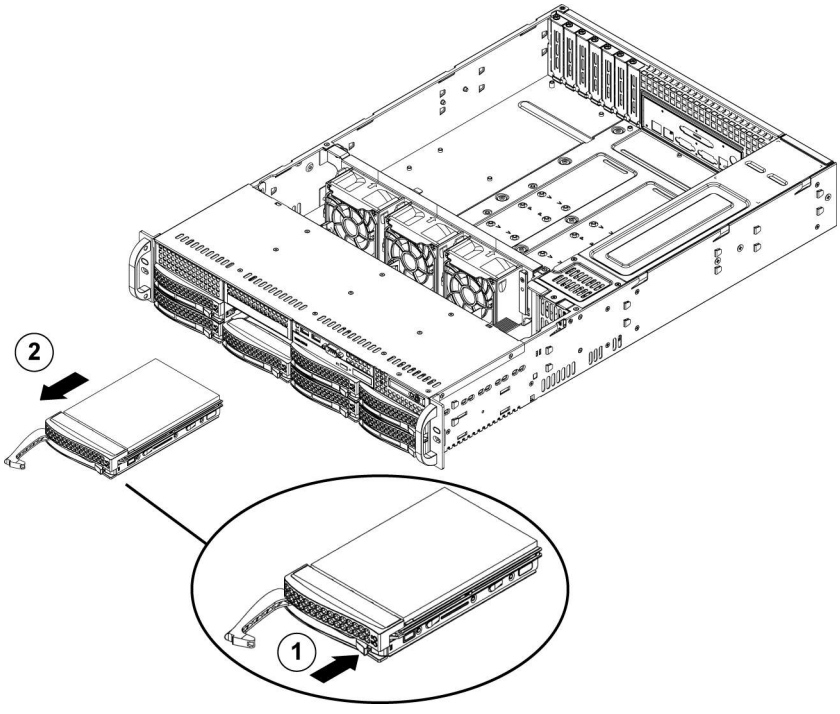
The drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drive bays.




| | |
|---|---|
| 1 | Drive carrier |
| 2 | Dummy drive |

**To remove hard drive trays from the chassis:**

1. Press the release button on the drive carrier. This extends the drive carrier handle.




2. Use the handle to pull the drive out of the chassis.

**Notice!**

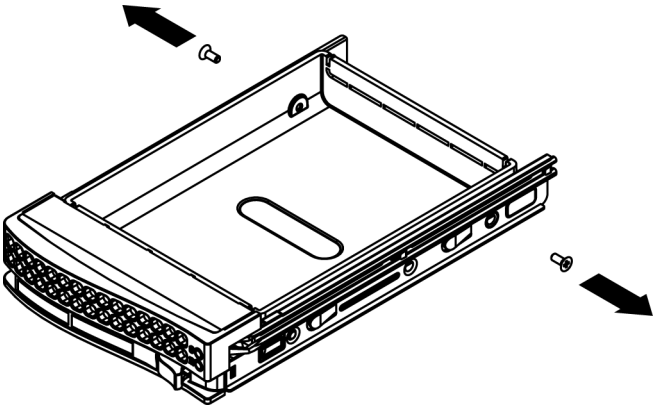
Except for short periods of time (swapping hard drives), do not operate the unit with the hard drives removed from the bays.

### 3.2.2 Installing a hard drive

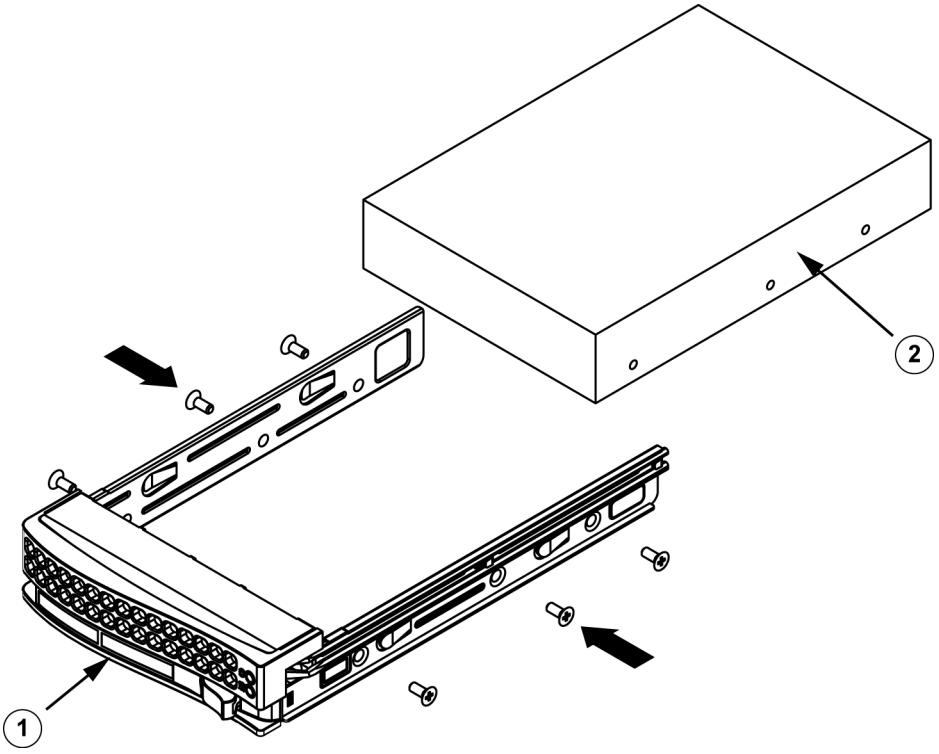
The drives are mounted in drive carriers.

**To install a hard drive to the hard drive carrier:**

1. Remove the screws securing the dummy drive to the carrier.

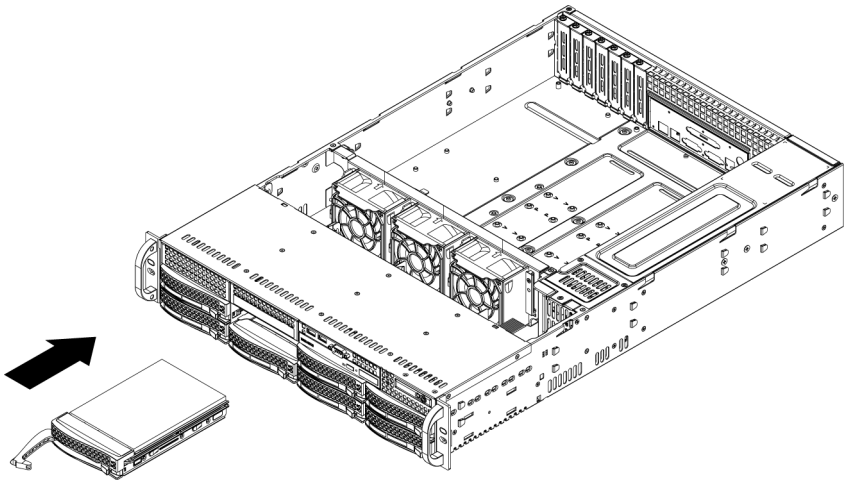


2. Remove the dummy drive from the carrier.
3. Install a new drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier.
4. Secure the hard drive by tightening all 6 screws.




| | | | |
|---|---|---|---|
| **1** | Drive carrier | 2 | SAS/SATA hard drive |

5. Replace the drive carrier into the chassis bay. Make sure that the drive carrier handle is completely closed.



**Notice!**

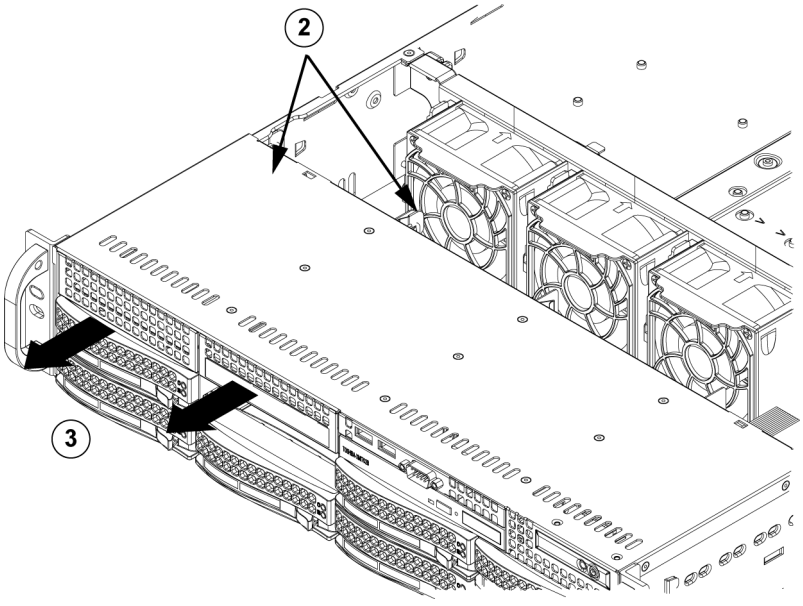
We recommend using the respective Bosch hard disk drives. The hard disk drives as one of the critical component are carefully selected by Bosch based on available failure rates. HDD – not delivered from Bosch – are not supported. Information on supported HDDs can be found in the datasheet in the Bosch Online Product Catalog.

## 3.3 Installing a fixed hard drive

The chassis models include two open slots for an optional floppy drive, and/or hard disk drive(s). To utilize these slots, the dummy drive and the slot cover must be removed.

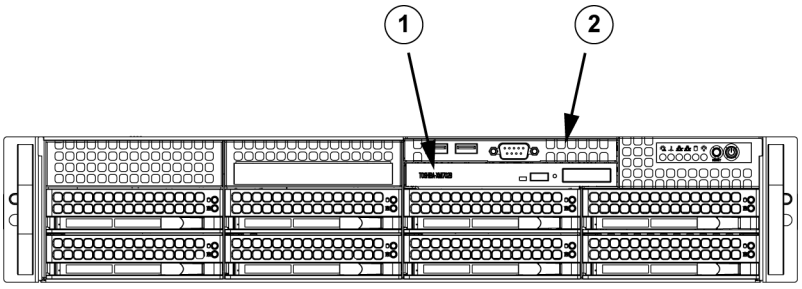
**To remove the dummy drive or hard disk drive:**

1. Disconnect the chassis from any power source.
2. Press the release tab.
3. Push against the back of the dummy drive, sliding the dummy drive and slot cover forward, out through the front of the chassis.
4. Insert the drive into rear of the open slot and connect the wiring.



## 3.4 Replacing or installing a DVD-RW

The chassis model includes a pre-installed slim DVD-RW drive.




| | | | |
|---|---|---|---|
| **1** | DVD-RW | **2** | Front Port Panel |

**To replace or install a DVD drive:**

1. Power down the system and if necessary, remove the unit from the rack.
2. Remove the chassis cover.
3. Unplug the drives power and data cables from the motherboard and/or backplane.
4. If you are adding a new DVD drive:
   Remove the mini-bezel (grate) from the drive bay The bezel can be removed by pulling out the hard drive beneath the DVD drive bay, then pulling the mini-bezel forward.
   If you are replacing a drive:
   Locate the locking tab at the rear (left hand side when viewed from the front) of the DVD drive. Push the tab toward the drive and push the drive unit out the front of the chassis.
5. Insert the new DVD drive in the slot until the tab locks in place.
6. Reconnect the data and power cables.
7. Replace the chassis cover (replace the unit in the rack, if necessary) and turn on the system.

## 3.5 Replacing the internal transcoder device

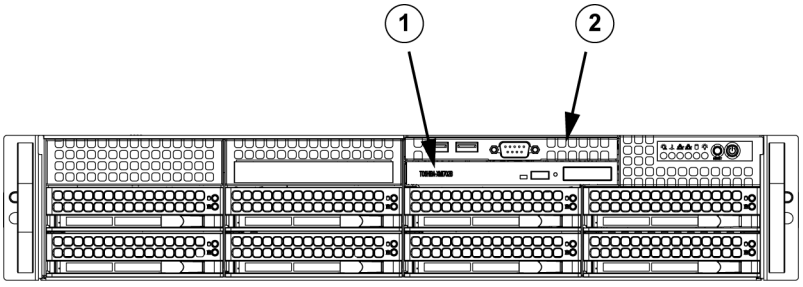
The chassis model includes an internal USB transcoder device.

**Notice!**

To replace or install the transcoder device, please apply to one of the Bosch RMA helpdesks.

## 3.6 Replacing or installing the front port panel

The chassis model includes a front port panel.




| | | | |
|---|---|---|---|
| **1** | DVD-RW | **2** | Front Port Panel |

**To replace or install the front port panel:**

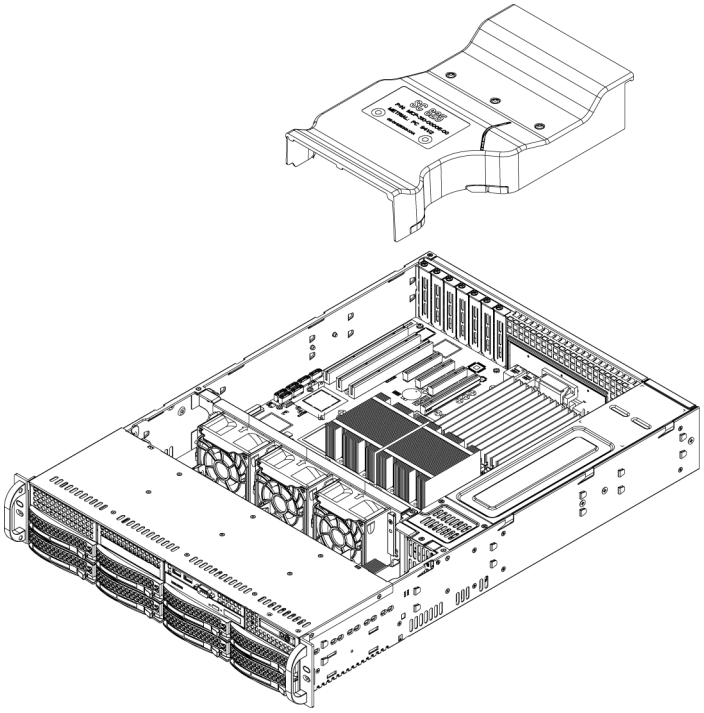
1. Turn off and unplug the unit.
2. Remove the chassis cover.
3. Disconnect the power and data cables from the front port panel to other chassis components including the motherboard and backplane.
4. Remove the old port panel by depressing the release tab, then pulling the unit out of the chassis.
5. Insert the new front port panel unit in the slot until the tab locks into place.
6. Connect the data and power cables to the backplane and motherboard.

## 3.7 Installing the motherboard

Motherboard problems will be handled by trained support people only.

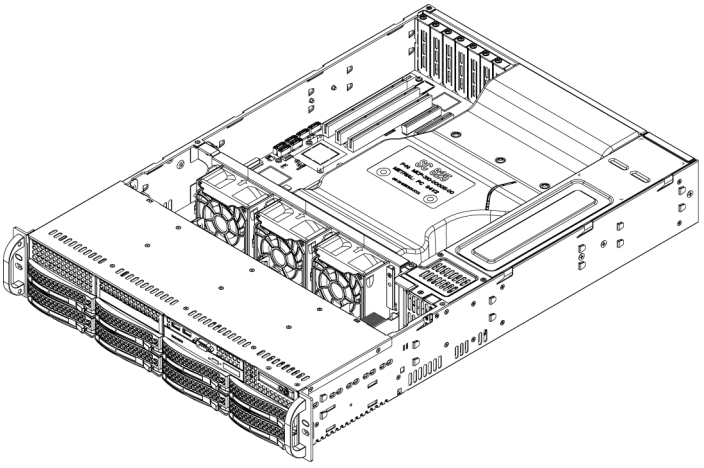
## 3.8 Installing the air shroud

Air shrouds concentrate airflow to maximize fan efficiency. The air shroud does not require screws to set up.



**To install the air shroud:**

- Place air shroud in the chassis. The air shroud fits behind the two fans closest to the power supply.
  **Note:** If a 16 DIMM (13.68" x 13") motherboard is used, it is necessary to use the optional MCP-310-82502-0N air shroud.



**See also:**

– *Checking the air flow, page 20*

## 3.9 Checking the air flow

After installing the air shroud we recommend checking the air flow.

**To check the air flow:**

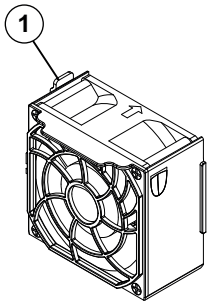
1. Make sure there are no objects to obstruct airflow in and out of the chassis. In addition, if you are using a front bezel, make sure the bezel's filter is replaced periodically.
2. Do not operate the system without drives or drive trays in the drive bays. Use only recommended material.
3. Make sure no wires or foreign objects obstruct air flow through the chassis. Pull all excess cabling out of the airflow path or use shorter cables. The control panel LEDs inform you about system status.

**See also:**

– *Installing the air shroud, page 19*
– *System interface, page 10*.
– *Installing the air shroud, page 19*.
– *Rack installation, page 24*.

## 3.10 Replacing the system fans

The system fans provide cooling for the chassis. These fans circulate air through the chassis as a means of lowering the chassis internal temperature.



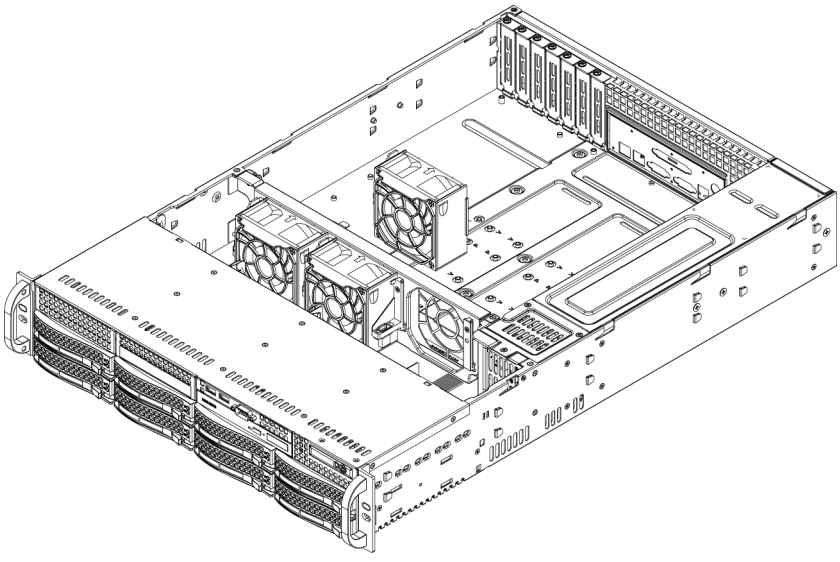

| | |
|---|---|
| 1 | Release Tab |

**Warning!**

The fans might still be turning when you remove the fan assembly from the chassis. Keep fingers, screwdrivers, and other objects away from the openings in the fan assembly's housing.

**To replace a system fan:**

1. If necessary, open the chassis while the power is running to determine which fan has failed. (Never run the system for an extended period of time with the chassis open.)
2. Turn off the power to the system and unplug the power cord from the outlet.
3. Remove the failed fan's wiring from the motherboard.
4. Press the fan release tab to lift the failed fan from the chassis and pull it completely from the chassis.
5. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.
6. Reconnect the power cord, turn on the system and make sure that the fan is working properly before replacing the chassis cover.

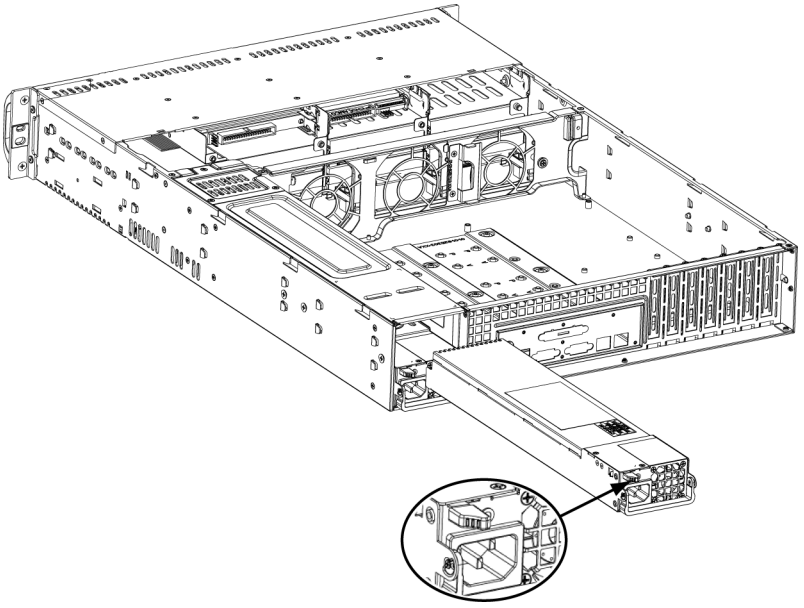


## 3.11 Power supply

The chassis has two redundant power supplies. The power supplies are auto-switching capable. This enables the power supplies to automatically sense and operate at a 100 V to 240 V input voltage.

**LED status:**

– Amber lighted LED: The power supply is off.
– Green lighted LED: The power supply is operating.



**Warning!**

Redundant power supplies

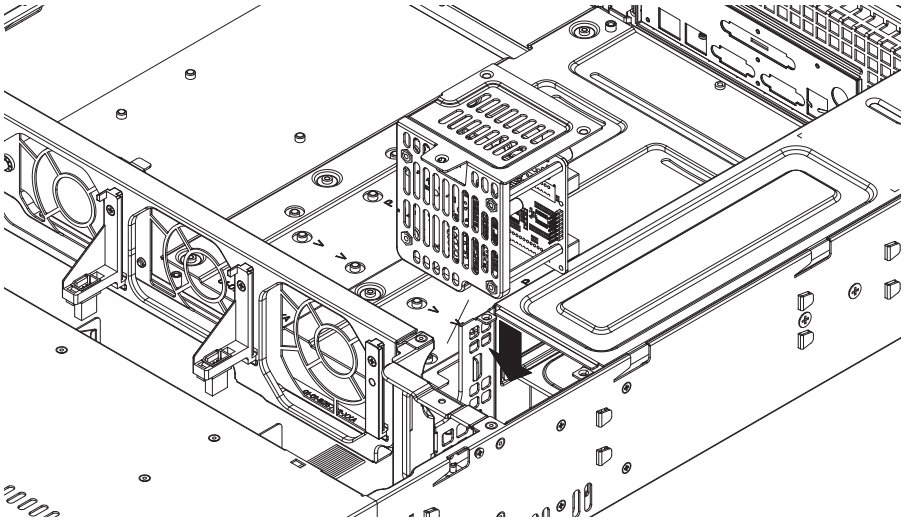
This unit might have more than one power supply connection. To de-energize the unit, remove all connections.

## 3.11.1 Replacing the power supply

The power supply can be replaced without turning off the system if a redundant power supply is available. Replacement units can be ordered directly from Bosch RMA desk.

**To replace the power supply:**

1. Only for units with one power supply: Turn off the unit and unplug the power cord.
2. Push the release tab (on the back of the power supply) as illustrated.
3. Pull the power supply out using the handle provided.
4. Replace the failed power module with the same model.
5. Push the new power supply module into the power bay until you hear a click.
6. Plug the AC power cord back into the module and turn on the unit.



### 3.11.2 Replacing the power distributor

Redundant server chassis that are 2U or greater require a power distributor. The power distributor provides failover and power supply redundancy.

**To replace the power distributor:**

1. Turn off the unit and remove the plug from the wall socket or power strip.
2. Remove all cable connections to the power supply from the motherboard, backplane, and other components. Also, remove both power supplies.
3. Locate the power distributor between the power supply and the fan row.
4. Remove the three screws securing the power supply.
5. Gently pull the power distributor from the chassis. Gently guide all the cables through the power distributor housing.
6. Slide the new power distributor module into the power distributor housing. Make that you slide the cables through the bottom of the housing.
7. Reconnect all the power cables, replace the power supply, and insert the plug into the wall.

# 4 Rack installation

This chapter provides a quick setup checklist to get your chassis up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time.

## 4.1 Unpacking the system

You should inspect the box the chassis was shipped in and note if it was damaged in any way. If the chassis itself shows damage, file a damage claim with the carrier who delivered it and notify the respective Bosch RMA desk.
You will also need it placed near at least one grounded power outlet.
Due to the weight of the system: After opening the top of the shipping box, one person should stand at either end and lift the disk array out together.
Be sure to read the safety precautions.

## 4.2 Preparing for setup

The box the system is shipped in includes a rack mount kit, which you will need to install the system into the rack.
Follow the steps in the order given to complete the installation process in a minimum amount of time. Read this section before you begin the installation procedure outlined in the sections that follow.

### 4.2.1 Choosing a setup location

- Situate the system in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. Place the system near a grounded power outlet.
- Leave approximately 25 inches clearance in front of the rack to be able to open the front door completely.
- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.
- Install the system only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

**Notice!**
This product is not suitable for use with visual display work place devices acccording to §2 of the the German Ordinance for Work with Visual Display Units.

### 4.2.2 Rack precautions

**Warning!**
To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installations, attach stabilizers to the rack.

- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- In multiple rack installations, couple the racks together.
- Always make sure the rack is stable before extending a component from the rack.
- Extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

### 4.2.3 General system precautions

- Review the electrical and general safety precautions that came with the components you are adding to your chassis.
- Determine the placement of each component in the rack before installing the rails.
- Install the heaviest components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the system from power surges, voltage spikes if you want to keep your system operating in case of a power failure.
- Allow the SATA hard drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the system closed when not servicing to maintain proper cooling.

**See also**

- *Safety precautions, page 5*

### 4.2.4 Rack mounting considerations

**Ambient operating temperature**

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

**Reduced airflow**

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

**Mechanical loading**

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

**Circuit overloading**

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

**Reliable ground**

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

## 4.3 Rack mounting instructions

This section provides information on installing the chassis into a rack unit. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

**Notice!**
This rail will fit a rack between 26" and 33.5" deep.

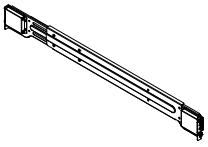
### 4.3.1 Separating the sections of the rack rails

The chassis package includes two rail assemblies in the rack mounting kit. Each assembly consists of two sections:

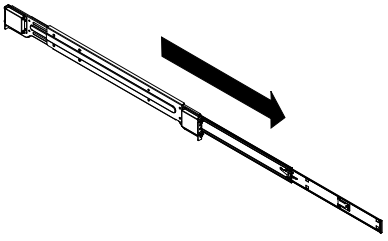
– an inner fixed chassis rail that secures directly to the chassis
– an outer fixed rack rail that secures directly to the rack itself.

**To separate the inner and outer rails:**

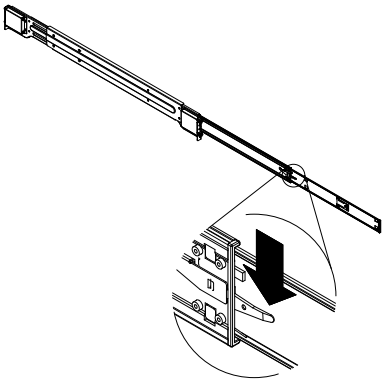
1. Locate the rail assembly in the chassis packaging.



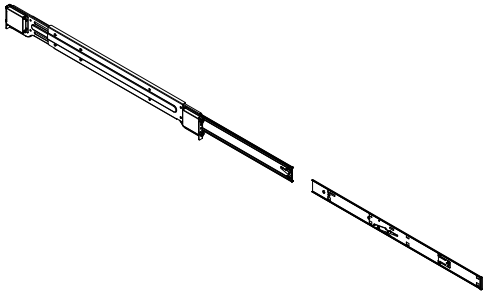
2. Extend the rail assembly by pulling it outward.



3. Press the quick-release tab.

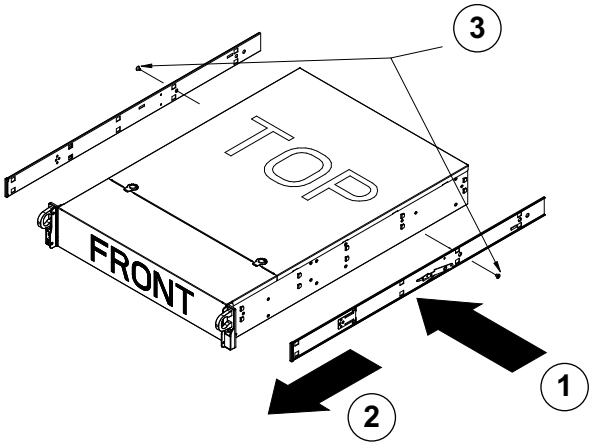


4. Separate the inner rail extension from the outer rail assembly.



### 4.3.2 Installing the inner rails

The chassis includes a set of inner rails in two sections: inner rails and inner rail extensions. The inner rails are pre-attached to the chassis, and do not interfere with normal use of the chassis if you decide not to use a server rack. The inner rail extension is attached to the inner rail to mount the chassis in the rack.

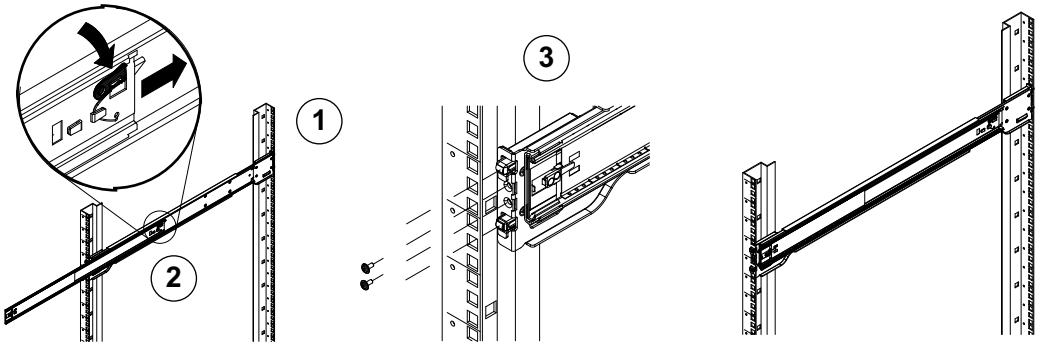



**To install the inner rails:**

1. Place the inner rail extensions on the side of the chassis aligning the hooks of the chassis with the rail extension holes. Make sure the extension faces "outward" just like the pre-attached inner rail.
2. Slide the extension toward the front of the chassis.
3. Secure the chassis with 2 screws as illustrated.
4. Repeat steps for the other inner rail extension.

### 4.3.3 Installing the outer rails to the rack

Outer rails attach to the rack and hold the chassis in place. The outer rails extend between 30 inches and 33 inches.



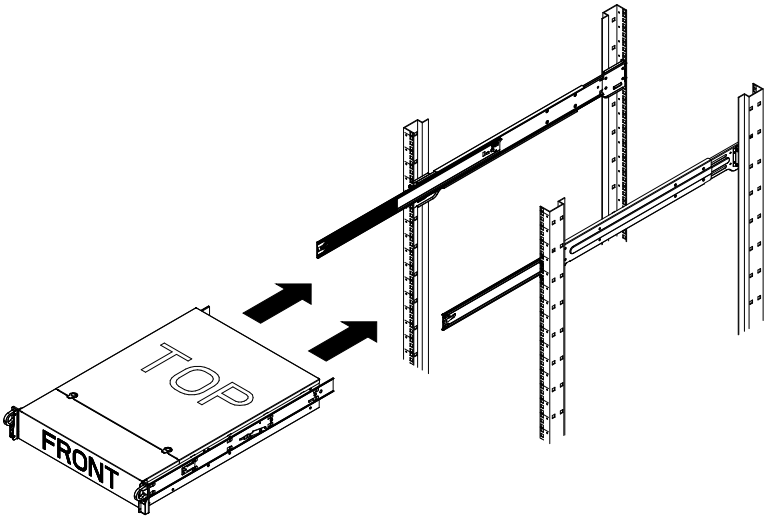
**To install the outer rails to the rack:**

1. Secure the back end of the outer rail to the rack, using the screws provided.
2. Press the button where the two outer rails are joined to retract the smaller outer rail.
3. Hang the hooks of the rails onto the rack holes and if desired, use screws to secure the front of the outer rail onto the rack.
4. Repeat steps 1-3 for the remaining outer rail.

**Locking Tabs**

Both chassis rails have a locking tab, which serves two functions. The first is to lock the system into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the system in place when fully extended from the rack. This prevents the system from coming completely out of the rack when you pull it out for servicing.

### 4.3.4 Installing the chassis into the rack




**To install the chassis into a rack:**

1. Extend the outer rails as illustrated above.
2. Align the inner rails of the chassis with the outer rails on the rack.
3. Slide the inner rails into the outer rails, keeping the pressure even on both sides. When the chassis has been pushed completely into the rack, it should click into the locked position.
4. Optional screws may be used to secure the to hold the front of the chassis to the rack.

**Warning!**

Do not pick up the unit with the front handles. The handles are designed to pull the system from a rack only.

**Warning!**

Stability hazard

Before sliding the unit out for servicing make sure that the rack stabilizing mechanism is in place, or the rack is bolted to the floor. Failure to stabilize the rack can cause the rack to tip over.

**See also:**

*Rack precautions, page 24*

### 4.3.5 Installing the chassis into a Telco rack

To install the chassis into a Telco type rack, use two L-shaped brackets on either side of the chassis (four in total). First, determine how far the chassis will extend out the front of the rack. Larger chassis should be positioned to balance the weight between front and back. If a bezel is included on the chassis, remove it. Then attach the two front brackets to each side of the chassis, then the two rear brackets positioned with just enough space to accommodate the width of the Telco rack. Finish by sliding the chassis into the rack and tightening the brackets to the rack.

## 4.4 Turning on the system

The last thing to be done is to provide input power to the system.

**To turn on the system:**

1. Plug the power cord from the power supply unit into a high-quality power strip that offers protection from electrical noise and power surges. We recommended using an uninterruptible power supply (UPS).
2. Press the power button on the control panel to turn on the system.

# 5 System setup - first steps

The following installation directive provides information on Installation and Configuration.
DIVAR IP systems are based on Windows Server 2008 R2 operating system.
This chapter is valid for DIVAR IP models that come with pre-installed hard drives. Empty units start into the DOM recovery menu on first start.
See also:
– *Recovering the unit, page 44*

## 5.1 Introduction

DIVAR IP systems are shipped with a pre-installed Configuration Wizard from factory.

## 5.2 Setup instruction

All DIVAR IP systems are preconfigured with a default IP address and with default iSCSI settings.
– IP Address: 192.168.0.200
– Subnet mask: 255.255.255.0
Observe the following:
– DIVAR IP needs to have an active network link during installation. Make sure that the network switch you are connecting to is powered on.
– The default IP address must not be occupied by any other device in the network.
– Determine whether the initial installation is on a DHCP network. If not then you must assign valid IP addresses to the video devices. Consult the local IT administrator to obtain a valid IP address range to be used with DIVAR IP and associated devices.
– The default iSCSI settings are optimized for use with Bosch VMS/VRM.

**User with administrator rights:**
– User: BVRAdmin
– Password: WSS4Bosch

**Notice!**
We strongly recommended not changing the user settings. Changing the user settings can result in malfunctioning of the system.

## 5.3 Starting the Appliccation

DIVAR IP system is ready to go out of the box. The application provides a simple to install and intuitive to use solution for network surveillance systems.

**To start the application:**
1. Connect the unit and the cameras to the network.
2. Turn on the unit.
   The Windows Server 2008 R2 setup process starts.
3. Select the appropriate language for the installation, then click **Next**.
4. In the **Country or region**, **Time and currency** and **Keyboard layout** lists, click the appropriate item, then click **Next**.
   The Microsoft Software License Terms and the EULA (End User License Agreement) are displayed.
5. Accept the license terms, then click **Start**. Windows restarts.
6. After restart is finished, press CTR+ALT+DELETE. The Windows logon page is displayed.
7. Enter the default password **WSS4Bosch**.

8. After entering the password, a message is displayed that you must change the password before logging on the first time. To confirm, click **OK**.
9. Change the password.
   A series of scripts perform important setup tasks. This can take several minutes. Do not turn off the computer.
   A page is displayed where you can perform initial Windows configuration tasks.
   **Note:** In case of password loss a system recovery must be performed as described in the installation manual. The configuration must be done from scratch or must be imported.
10. Click the **Set time zone**, **Configure networking** and **Provide computer name and domain** link, enter the appropriate information, then click **Close**. Windows restarts.
11. Press CTR+ALT+DELETE. The Windows logon page is displayed.
12. Enter the password.
    The Bosch VMS default screen is displayed.
13. Double-click the **Bosch VMS Wizard** icon to start the Configuration Wizard.
    The **Welcome** page is displayed.
14. Configure the system using the Configuration Wizard.

**Notice!**
If the IP addresses of devices that should be added fall within the same IP range as the DIVAR IP, you can use the Configuration Wizard. In all other cases we recommend using the Bosch VMS Configuration Client.

**Notice!**
To perform administrative tasks, the BVRAdmin account can be entered when Bosch VMS default screen is displayed. To do so, press CTRL+ALT+DEL, then hold down SHIFT while clicking the **Switch User** option.

**See also:**
- *Using Configuration Wizard, page 31*
- *Using Bosch VMS Configuration Client, page 42*
- *Recovering the unit, page 44*

## 5.4 Using Configuration Wizard

Intended use for Configuration Wizard is the quick and easy configuration of a smaller system. Configuration Wizard helps you to achieve a configured system including VRM, iSCSI system, cameras, recording profiles and user groups.
User groups and their permissions are configured automatically. You can add or remove users and set passwords.
Configuration Wizard can access Management Server only on the local computer.
You can save an activated configuration for backup purposes and import this configuration later. You can change this imported configuration after import.
Configuration Wizard adds the local VRM automatically.

**Restrictions:**
The following tasks cannot be done with the Configuration Wizard. Use Bosch VMS Configuration Client instead.
- adding additional license packages
- adjusting schedules
- configuring systems with no or multiple VRM

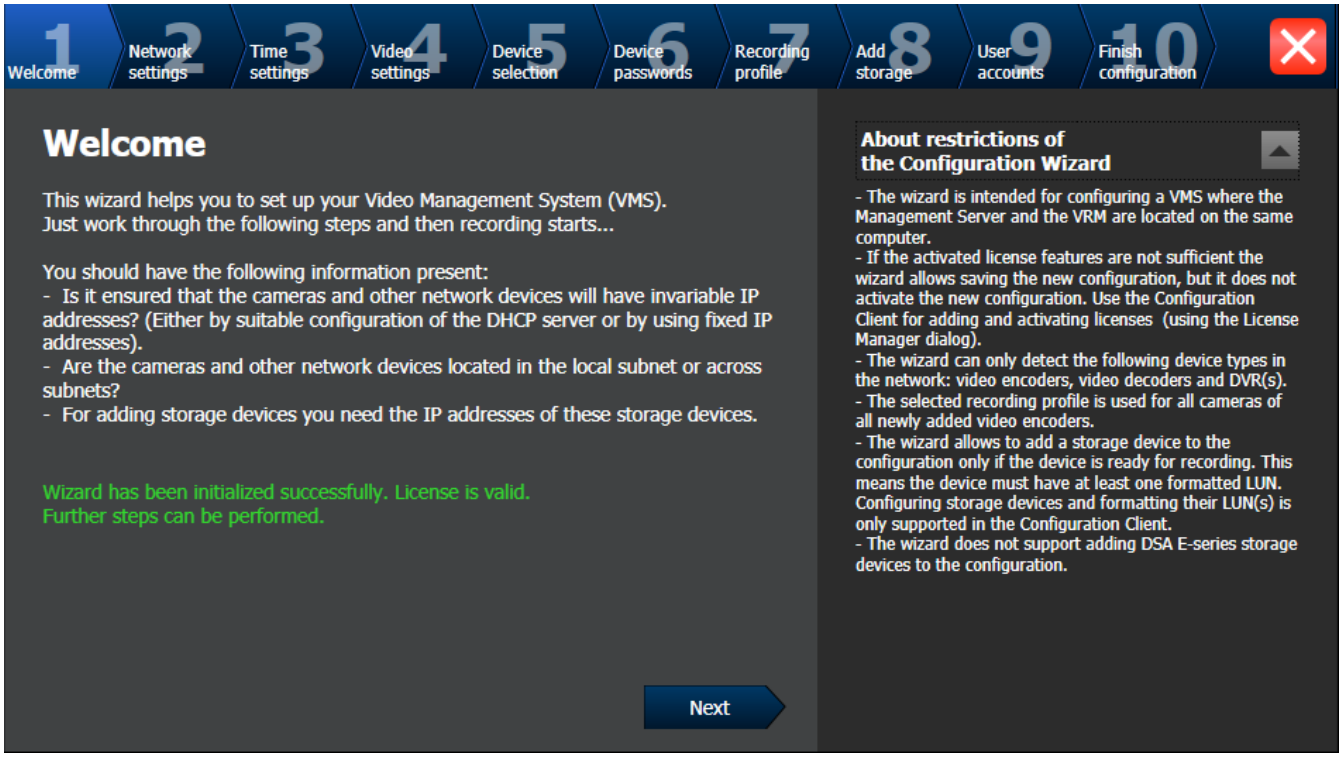
– configuring external storage devices
– all advanced configurations beyond a basic setup (maps or alarms, for example)

For these tasks refer to the Bosch VMS manual (see *Additional documentation and client software, page 60*).

To achieve a quick configuration using the Configuration Wizard:

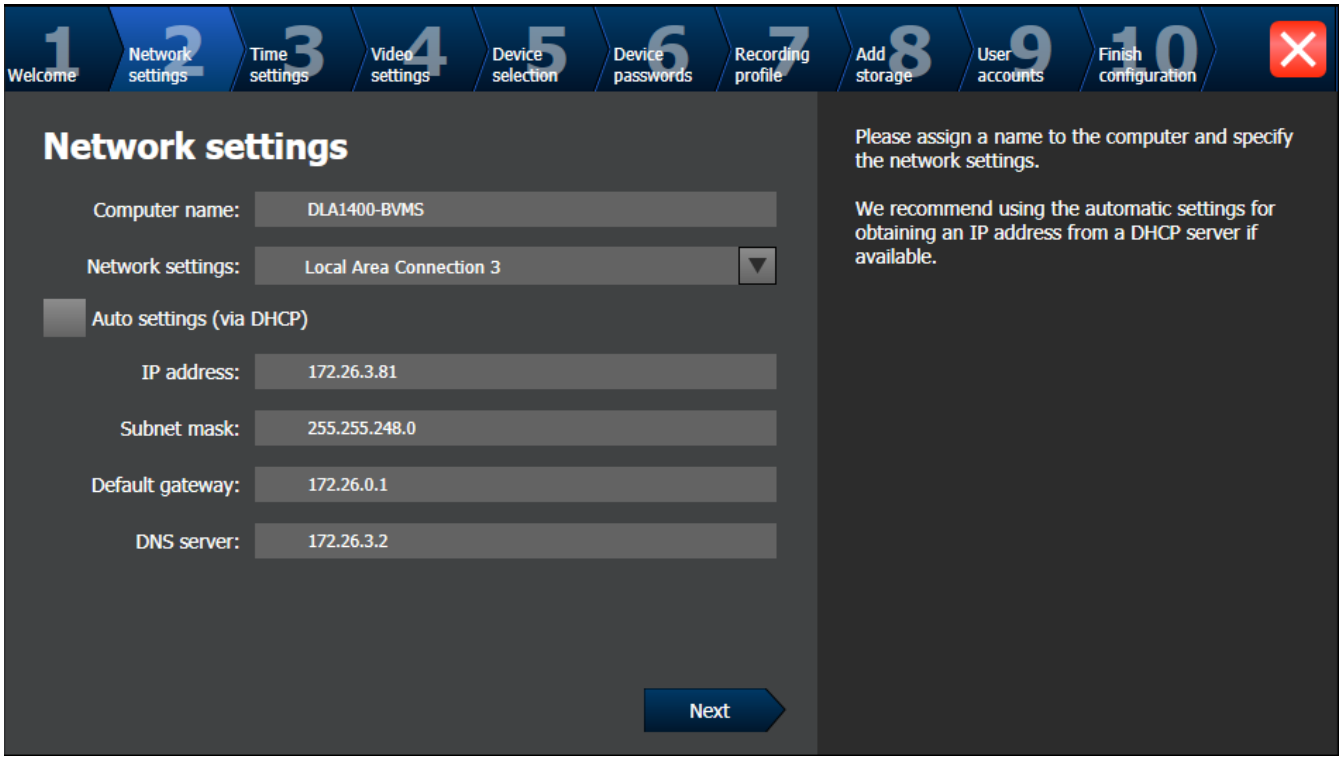
1. On the Bosch VMS default screen, double-click the **Bosch VMS Wizard** icon. The **Welcome** page is displayed.
2. Run-through the following pages of the wizard.

**Welcome page**


1 Welcome
2 Network settings
3 Time settings
4 Video settings
5 Device selection
6 Device passwords
7 Recording profile
8 Add storage
9 User accounts
10 Finish configuration
Welcome
This wizard helps you to set up your Video Management System (VMS).
Just work through the following steps and then recording starts...
You should have the following information present:
- Is it ensured that the cameras and other network devices will have invariable IP addresses? (Either by suitable configuration of the DHCP server or by using fixed IP addresses).
- Are the cameras and other network devices located in the local subnet or across subnets?
- For adding storage devices you need the IP addresses of these storage devices.
Wizard has been initialized successfully. License is valid.
Further steps can be performed.
Next
About restrictions of the Configuration Wizard
- The wizard is intended for configuring a VMS where the Management Server and the VRM are located on the same computer.
- If the activated license features are not sufficient the wizard allows saving the new configuration, but it does not activate the new configuration. Use the Configuration Client for adding and activating licenses (using the License Manager dialog).
- The wizard can only detect the following device types in the network: video encoders, video decoders and DVR(s).
- The selected recording profile is used for all cameras of all newly added video encoders.
- The wizard allows to add a storage device to the configuration only if the device is ready for recording. This means the device must have at least one formatted LUN. Configuring storage devices and formatting their LUN(s) is only supported in the Configuration Client.
- The wizard does not support adding DSA E-series storage devices to the configuration.

If the connection to the Management Server cannot be established, a corresponding error message is displayed. You cannot continue working with Configuration Wizard.
If VRM is not available on the computer, a corresponding error message is displayed. You cannot continue working with Configuration Wizard.
If the license check fails, a corresponding error message is displayed. You cannot continue working with Configuration Wizard.

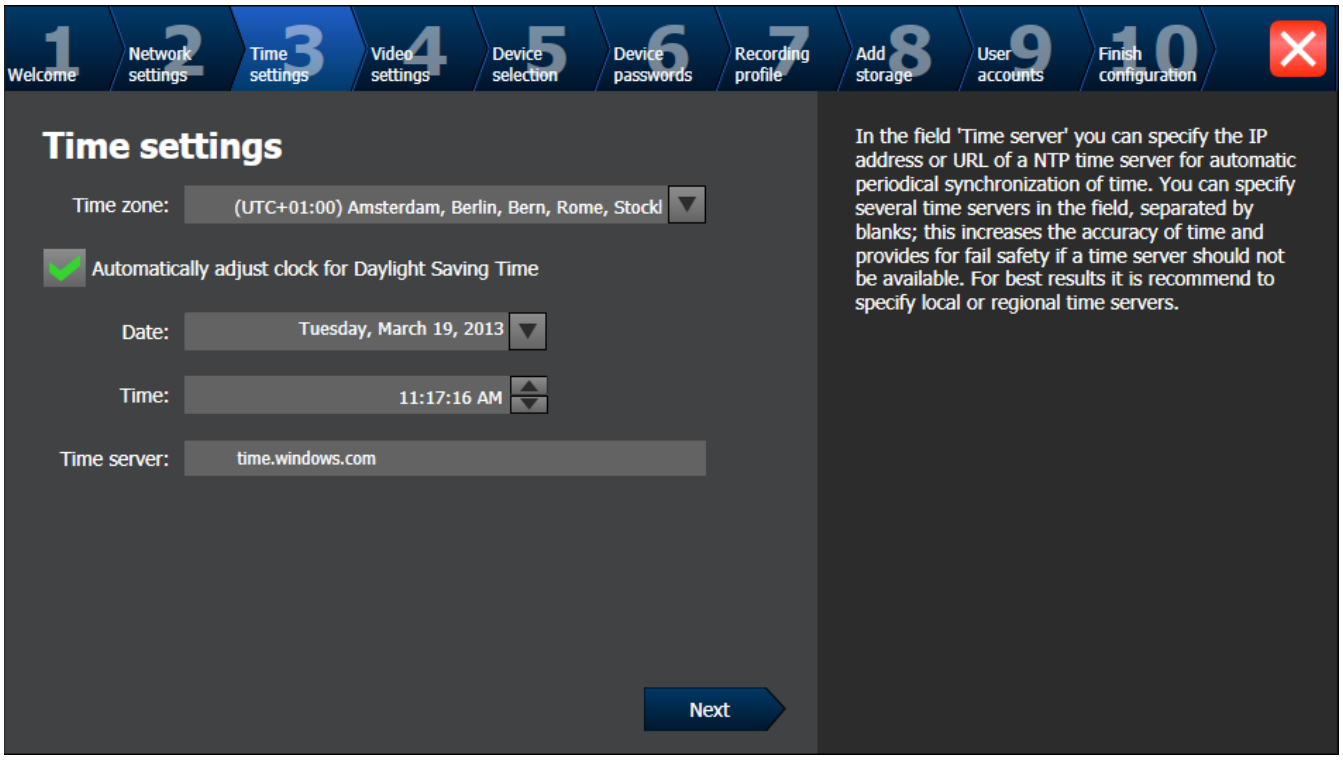
**Network settings page**




You configure the network settings of the operating system.
As soon as you click **Next** button, the settings are activated.
If you have changed any setting on this page, click **Reboot** to restart the system.

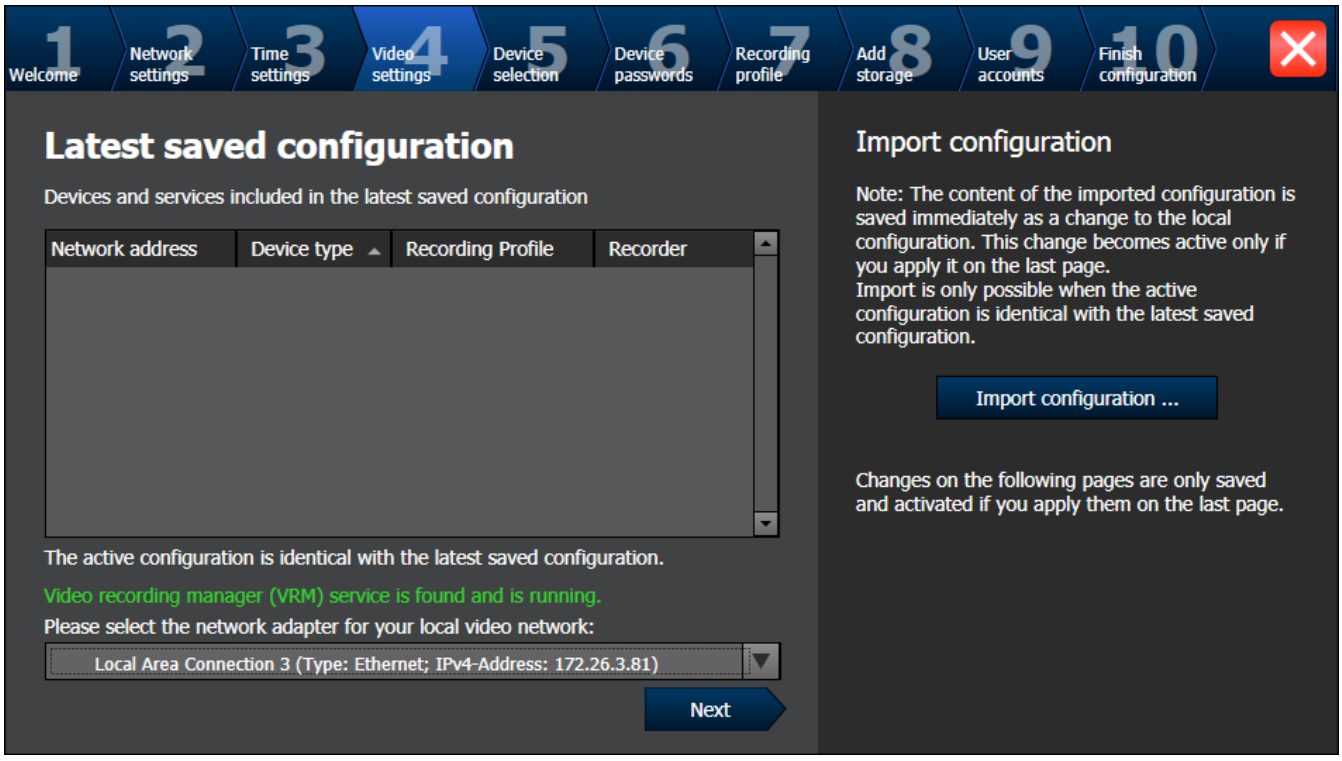
**Notice!**
If a DHCP server is employed in the network for the dynamic assignment of IP addresses, activate acceptance of IP addresses automatically assigned to the device.
Certain applications (VRM, Bosch Video Management System, Bosch Video Client, Configuration Manager) use the IP address for the unique assignment of the device. If using these applications, the DHCP server must support the fixed assignment between IP address and MAC address, and must be appropriately set up so that, once an IP address is assigned, it is retained each time the system is rebooted.

**Time settings page**


1 Welcome
2 Network settings
3 Time settings
4 Video settings
5 Device selection
6 Device passwords
7 Recording profile
8 Add storage
9 User accounts
10 Finish configuration
Time settings
Time zone:
(UTC+01:00) Amsterdam, Berlin, Bern, Rome, Stockl
Automatically adjust clock for Daylight Saving Time
Date:
Tuesday, March 19, 2013
Time:
11:17:16 AM
Time server:
time.windows.com
Next
In the field 'Time server' you can specify the IP address or URL of a NTP time server for automatic periodical synchronization of time. You can specify several time servers in the field, separated by blanks; this increases the accuracy of time and provides for fail safety if a time server should not be available. For best results it is recommend to specify local or regional time servers.

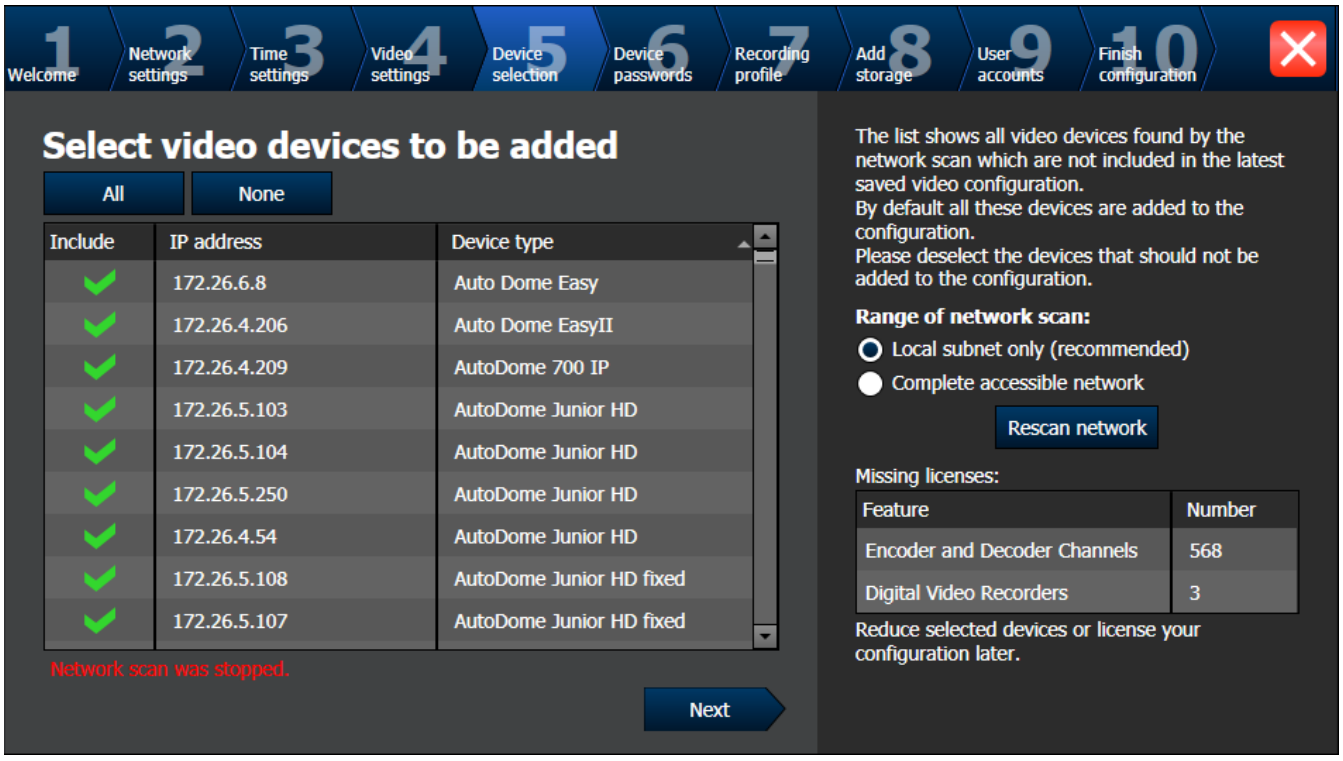
You configure the time settings of the operating system.

### Video settings page


1 Welcome
2 Network settings
3 Time settings
4 Video settings
5 Device selection
6 Device passwords
7 Recording profile
8 Add storage
9 User accounts
10 Finish configuration
Latest saved configuration
Devices and services included in the latest saved configuration
Network address
Device type
Recording Profile
Recorder
The active configuration is identical with the latest saved configuration.
Video recording manager (VRM) service is found and is running.
Please select the network adapter for your local video network:
Local Area Connection 3 (Type: Ethernet; IPv4-Address: 172.26.3.81)
Next
Import configuration
Note: The content of the imported configuration is saved immediately as a change to the local configuration. This change becomes active only if you apply it on the last page.
Import is only possible when the active configuration is identical with the latest saved configuration.
Import configuration ...
Changes on the following pages are only saved and activated if you apply them on the last page.

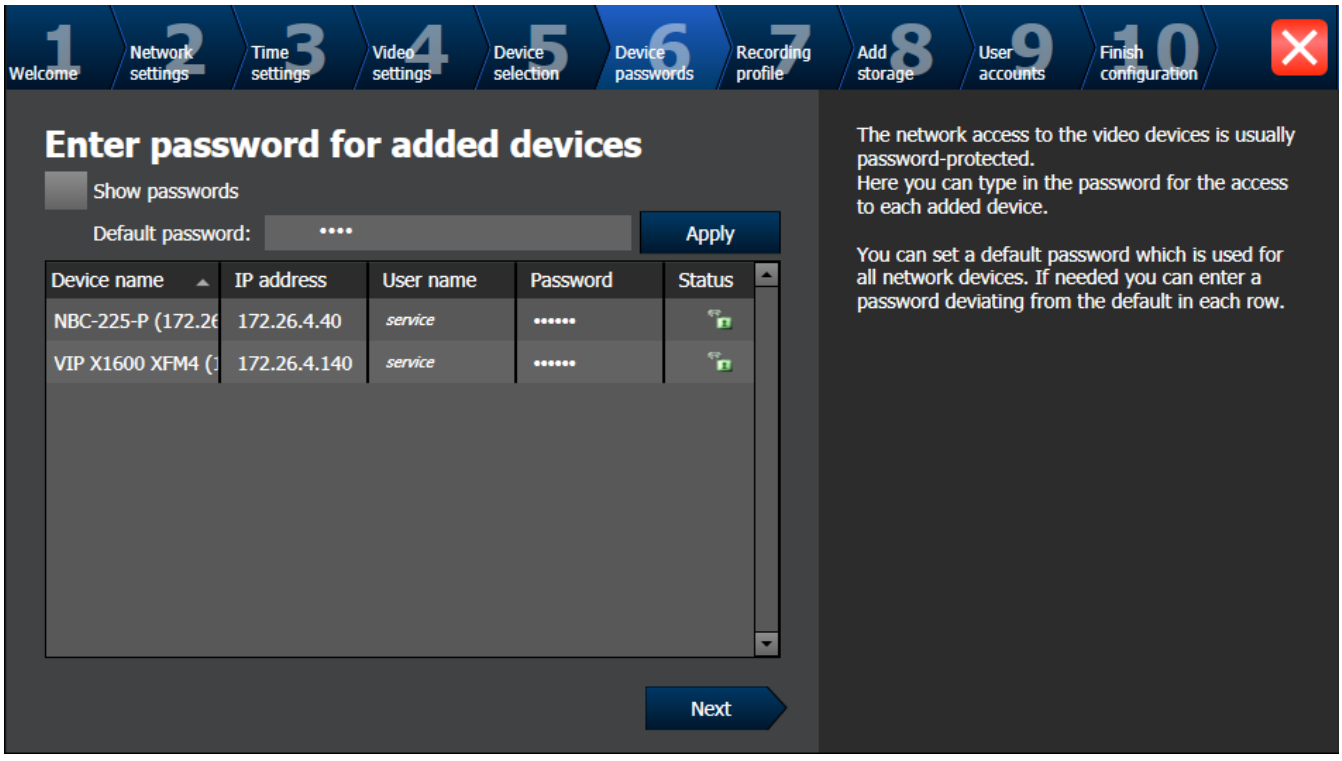
This page displays the devices and services that are included in the latest saved configuration. You can import a configuration.

### Device selection page



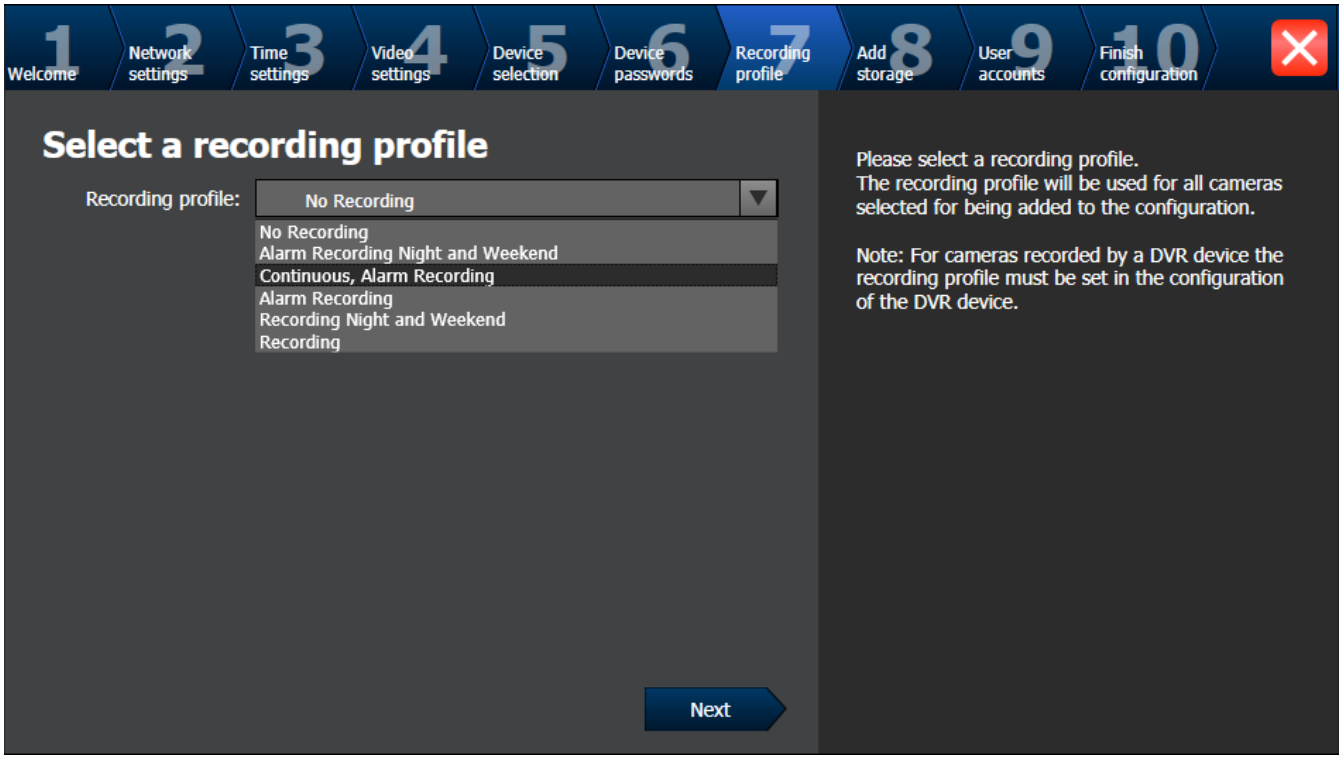

This page displays all video devices that are not included in the latest saved configuration. Deselect the devices that should not be added to the configuration, then click **Next**.

### Device passwords page




This page is used to authenticate password protected devices. This can either be done for all cameras at once (if passwords are identical) or for each camera individually. Configuration Client must be used in order to set or change device passwords.
Password check is performed automatically, when you do not enter a character in a password field for a few seconds or you click outside the password field.

**Recording profile page**


1 Welcome
2 Network settings
3 Time settings
4 Video settings
5 Device selection
6 Device passwords
7 Recording profile
8 Add storage
9 User accounts
10 Finish configuration
Select a recording profile
Recording profile:
No Recording
No Recording
Alarm Recording Night and Weekend
Continuous, Alarm Recording
Alarm Recording
Recording Night and Weekend
Recording
Please select a recording profile.
The recording profile will be used for all cameras selected for being added to the configuration.
Note: For cameras recorded by a DVR device the recording profile must be set in the configuration of the DVR device.
Next

For different profile assignments to different cameras you must execute Configuration Wizard multiple times.

**Note:**
Before selecting a recording profile observe the following:

– **Recording profile details**

All video devices use the default recording profile details.

| Profile | Scheduled Time | Continuous | Pre-Alarm | Past alarm |
|---|---|---|---|---|
| Alarm Recording | Day/ Night / Weekend | - | Normal Quality 10 Seconds | Good Quality 10 Seconds |
| Alarm Recording Night and Weekend | Night and Weekend | - | Normal Quality 10 Seconds | Good Quality 10 Seconds |
| Continuous , Alarm Recording | Day/ Night / Weekend | Continuous Normal Quality | - | Good Quality 10 Seconds |
| Recording | Day/ Night / Weekend | Continuous Normal Quality | - | - |
| Recording Night and Weekend | Night and Weekend | Continuous Normal Quality | - | - |

To change these use the Bosch VMS Configuration Client.

– **Stream quality settings**

All video devices use the default settings for Stream 1 to record.

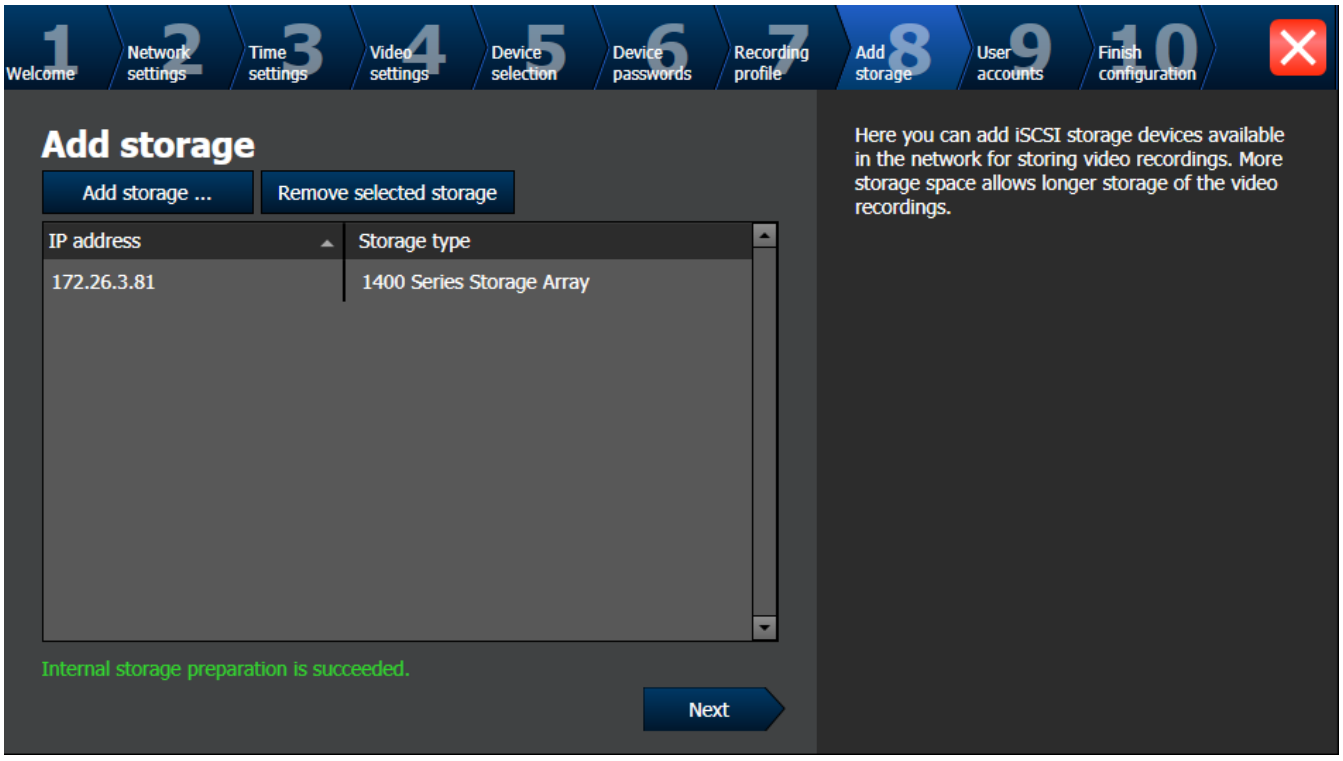
| Name | SD Resolution | Frames per second( FPS) | Target Bit Rate | Maximum Bit Rate |
|---|---|---|---|---|
| Normal | CIF | 7.5 IPS | 512 Kbps | 1024 Kbps |
| Good | 2CIF | 15 IPS | 1024 Kbps | 2048 Kbps |
| Excellent | 4CIF | 30 IPS | 2048 Kbps | 4096 Kbps |
| HD 720P | HD 720P | 30 IPS | 5000 Kbps | 10000 Kbps |
| HD1080P | HD1080P | 30 IPS | 5000 Kbps | 10000 Kbps |

To change these use the Bosch VMS Configuration Client.

– **Schedule**

The default schedule is used for all recording profiles.
The Day schedule is active from 8 a.m. until 6 p.m., Monday through Friday.
The Night schedule is active from 6 p.m. until 8 a.m., Monday through Friday.
The Weekend schedule is active 24 hours a day for Saturday and Sunday.
To change the schedule use the Bosch VMS Configuration Client.

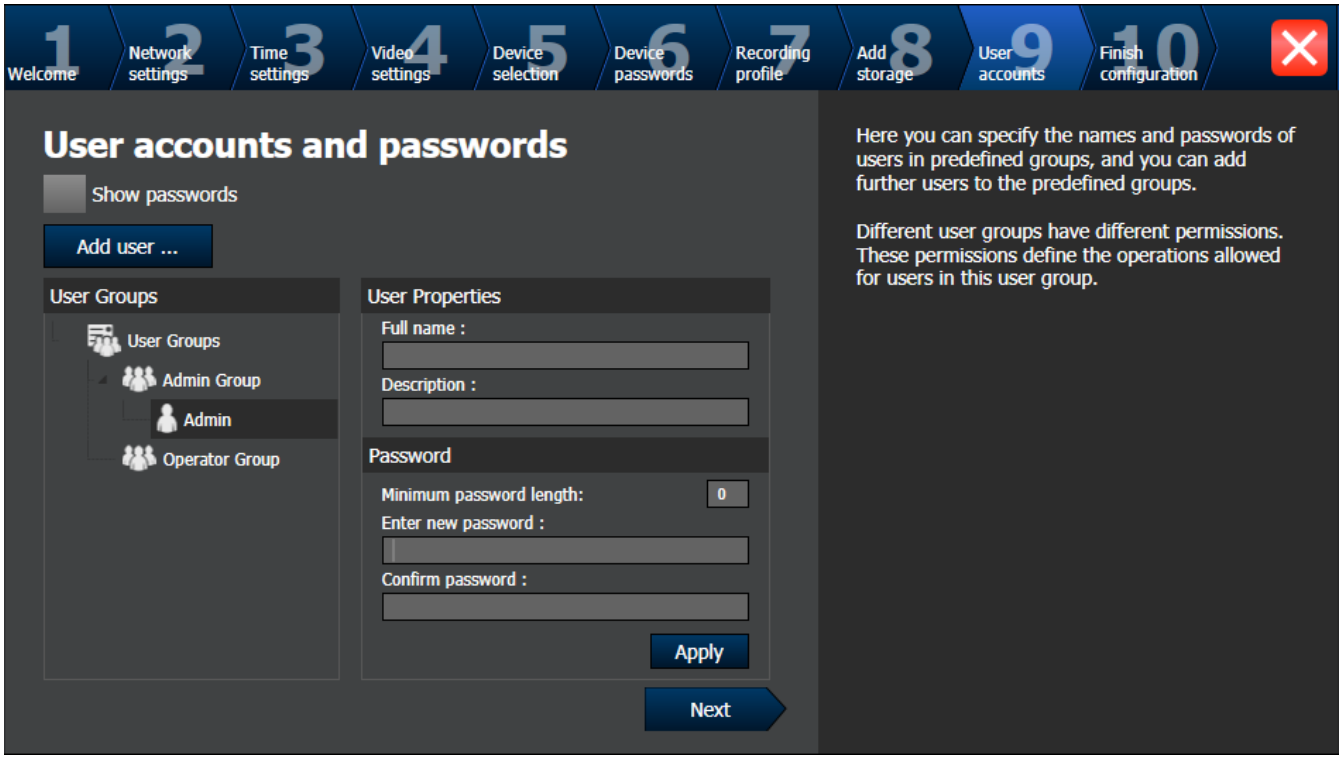
### Add storage page




This page allows the addition of additional iSCSI storage devices
For limitations, refer to the datasheet available in the online catalog.

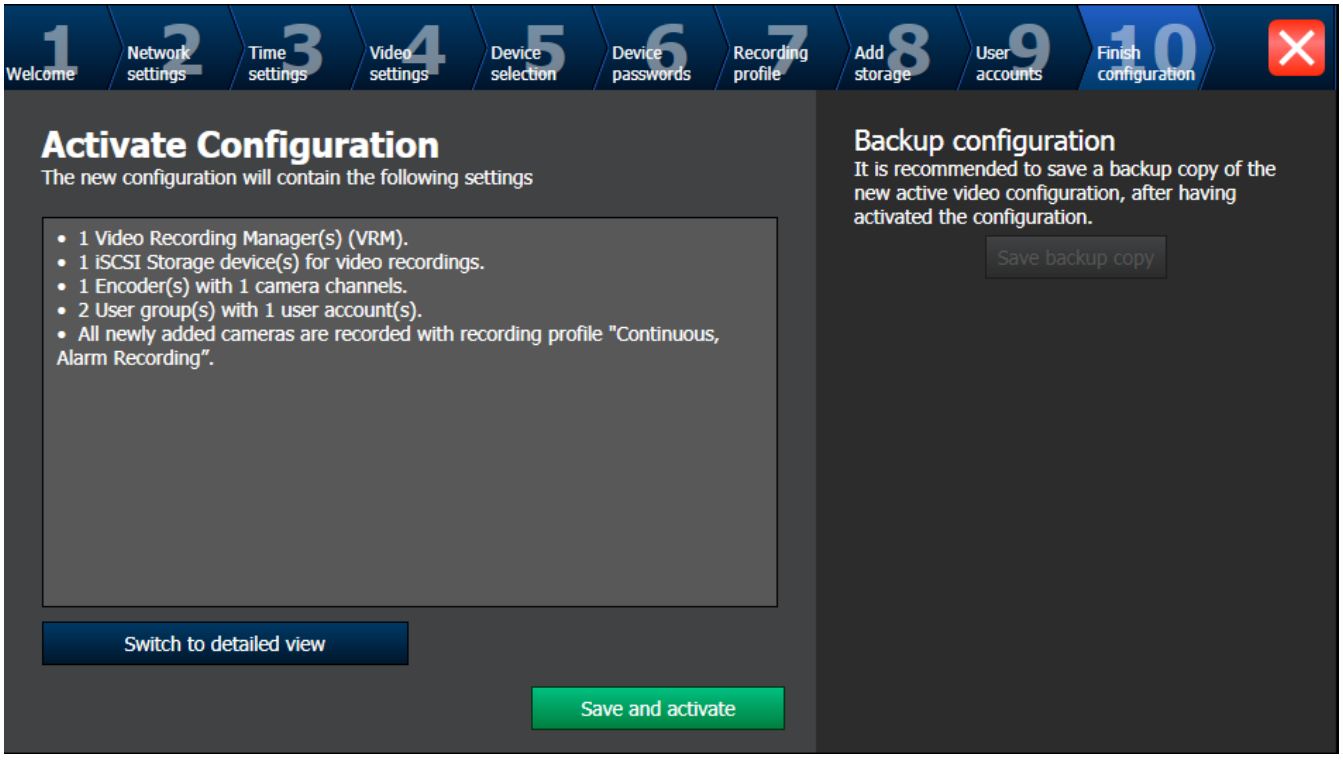
**Notice!**
If the wizard stops and the message appears, that the internal iSCSI storage is not ready for recording because the LUNs are not formatted, you must format the LUNs using Bosch VMS Configuration Client.
To format the LUNs, see Bosch VMS Configuration Manual, Chapter **Formatting a LUN**.

**User accounts page**




You can add users and passwords. Use Configuration Client to add user groups and to change permissions.

**Finish configuration page**


1 Welcome
2 Network settings
3 Time settings
4 Video settings
5 Device selection
6 Device passwords
7 Recording profile
8 Add storage
9 User accounts
10 Finish configuration
Activate Configuration
The new configuration will contain the following settings
• 1 Video Recording Manager(s) (VRM).
• 1 iSCSI Storage device(s) for video recordings.
• 1 Encoder(s) with 1 camera channels.
• 2 User group(s) with 1 user account(s).
• All newly added cameras are recorded with recording profile "Continuous, Alarm Recording".
Switch to detailed view
Save and activate
Backup configuration
It is recommended to save a backup copy of the new active video configuration, after having activated the configuration.
Save backup copy

After clicking **Save and activate** the configuration is activated.
After successful activation the **Activate Configuration** page is displayed again. Now you can store a backup of the configuration if desired: Click **Save backup copy**.

## 5.5 Using Bosch VMS Configuration Client

If the IP addresses of devices that should be added do not fall within the same IP range as the DIVAR IP, we recommend using the Bosch VMS Configuration Client.

**To assign device IP addresses:**

1. On the Bosch VMS default screen, double-click the Configuration Client icon to change device network settings. The application starts.
2. Enter the following, then click **OK**.
   **User name:** admin
   **Password:** no password required (if not set with the wizard)
   **Connection:** 127.0.0.1
3. On the **Hardware** menu, click **Initial Device Scan**.
   The application performs a network scan for all defaulted devices.
4. To assign all devices at once, click **Select All**, then right-click the selected devices, then click **SetIP Addresses**. The **Set IP Addresses** dialog box is displayed.
   **Note:**
   It is also possible to configure the devices individually with specific IP addresses based on MAC address.
5. Enter the starting IP address for the address range you want to use, click the **Calculate** tab, then click **OK**.
6. To restart the devices, click **OK**.
7. Close Configuration Client .

## 5.6 Using Bosch VMS Operator Client

Use Bosch VMS Operator Client to verify the live, recording and playback functionality of DIVAR IP.

**To verify live image functionality in the Operator Client**

1. On the Bosch VMS default screen, double-click the Operator Client icon . The application starts.
2. Enter the following and click **OK**.
   **User name:** admin
   **Password:** no password required (if not set with the wizard)
   **Connection:** 127.0.0.1
3. Click the live image icon. The Logical Tree with the cameras is displayed.
4. Select a camera and drag it to an image window. The image of the camera is displayed if the camera is assigned correctly.
   **Note:**
   Cameras in the image window with a red dot in the camera's icon are viewed live.

**To verify recording functionality in the Operator Client**

- Cameras in the Logical Tree with a red dot in the camera's icon are recording.

**To verify playback functionality in the Operator Client**

- The time line moves if the a camera is viewed in playback mode.

To perform further functionalities refer to the Bosch VMS manual.

**Performance overview live**

| | **4CIF** | | |
|---|---|---|---|
| | **2.5 Mbit** | **5 Mbit** | **10 Mbit** |
| Number of software monitors | 20 | 13 | 9 |

| | **720p** | | |
|---|---|---|---|
| | **2.5 Mbit** | **5 Mbit** | **10 Mbit** |
| Number of software monitors | 14 | 11 | 6 |

| | **1080p** | | |
|---|---|---|---|
| | **2.5 Mbit** | **5 Mbit** | **10 Mbit** |
| Number of software monitors | 8 | 6 | 5 |

References to the manual are described in *Additional documentation and client software, page 60*.

# 6 Recovering the unit

## 6.1 System recovery options

Following procedure describes how to restore the factory default image.

**To restore the unit to factory default image**

1. Start the unit and press **F11** during the BIOS power-on-self-test.

**Notice!**

Make sure that a DVI monitor, a keyboard and a mouse are connected to the unit.

2. Select **SATA:4M-ATP Velocity MI SATA DO** in boot device menu.
   The Recovery menu is displayed.
3. Select one of the following:
   - **Initial Factory Setup (all data on the system will be lost)**
     (restores to factory default image and deletes all data on the HDDs)
     or
   - **System Recovery (back to Factory Defaults)**
     (restores to factory default image; data on the HDDs will not be deleted)

   **Note:**
   Windows performs the setup. The screen displays the percentage of the process.

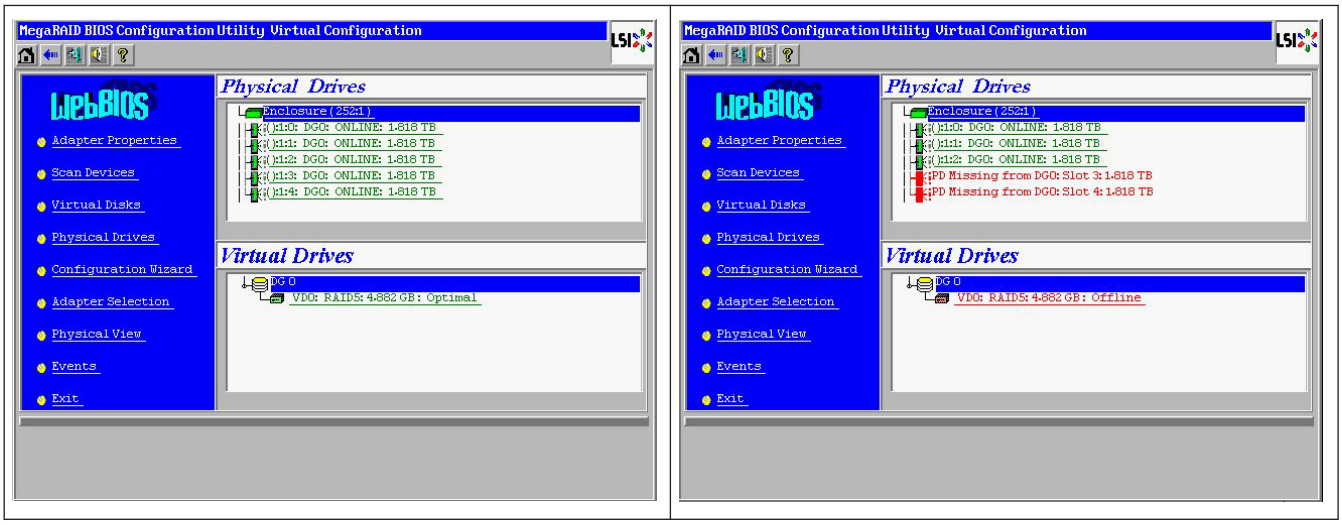
**Notice!**

Do not turn off the unit during the process. This will damage the Recovery media.

4. The unit starts from the Recovery media. If the setup is successfull. press **Yes** to restart the system.
5. Windows performs the initial setup of the operating system. The unit restarts after Windows has completed the setup.
6. After the restart of the unit, the factory default settings are installed and the Windows logon screen is displayed.
   The factory default settings are:
   - IP address: 192.168.0.200
   - Subnet mask: 255.255.255.0
   - User: BVRAdmin
   - Password: WSS4Bosch

## 6.2 RAID disaster recovery

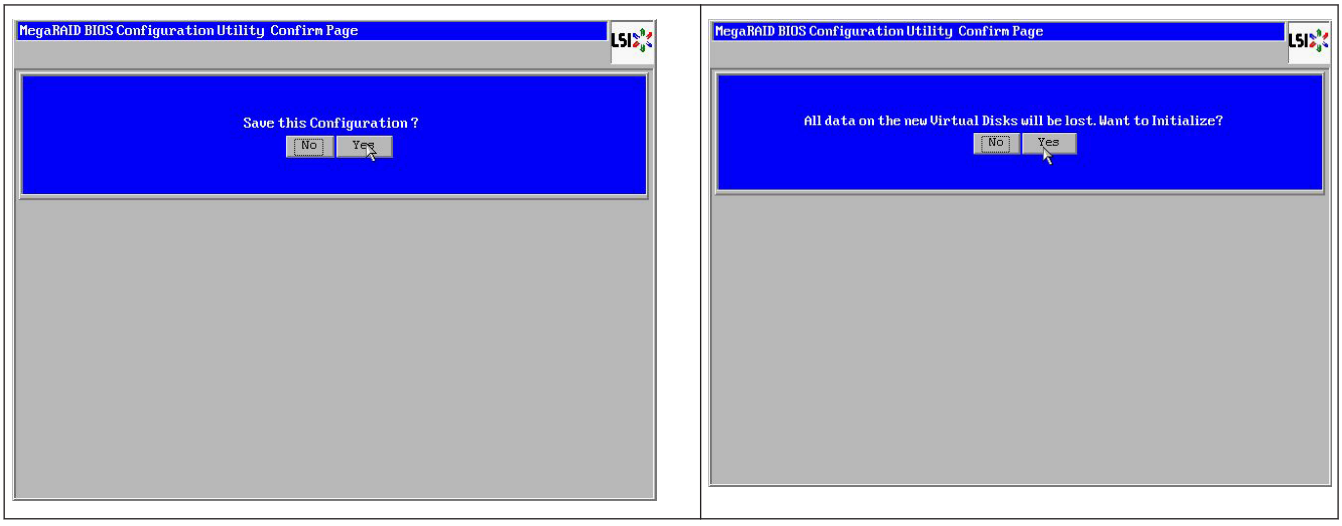
A failure of multiple disks (offline - status) happens in different ways that involve various, sometimes unusual methods to restore the RAID system. Normally, the cache of the RAID disks should be set to "write through" if no UPS is active, and the controller be buffered by a battery, when controller cache is set to "write back". Nevertheless, both caches have a great influence on the RAID performance.




Basically, the RAID controller writes the raidconfiguration - information (COD = configuration-on-disk) in an only field on each disk managed by the controller. The data area of a disk is never used by this, no matter, how often you write and delete the RAID configuration. "New" or "Clear" Configuration deletes the COD, if available.

MegaRAID BIOS Configuration Utility Configuration Wizard
Configuration Wizard guides you through the steps for configuring the MegaRAID system easily and efficiently. The steps are as follows:
1. Disk Group definitions Group physical drives into Disk Groups.
2. Virtual Disk definitions Define virtual disks using those arrays.
3. Configuration Preview Preview configuration before it is saved.
Please choose appropriate configuration type:
Clear Configuration Allows you to clear existing configuration only.
New Configuration Clears the existing configuration. If you have any existing data in the earlier defined drives, the data will be lost.
Add Configuration Retains the old configuration and then adds new drives to the configuration. This is the safest operation as it does not result in any data loss.
Cancel
Next
MegaRAID BIOS Configuration Utility Config Wizard - VD Definition
RAID Level RAID 0
Strip Size 64 KB
Access Policy RW
Read Policy Normal
Write Policy WThru
Wrthru for BAD BBU
IO Policy Direct
Disk Cache NoChange
Disable BGI No
Select Size 0 KB
DG 0
VD 0
Press Back Button To Add Another VD.
Reclaim
Cancel
Back
Next

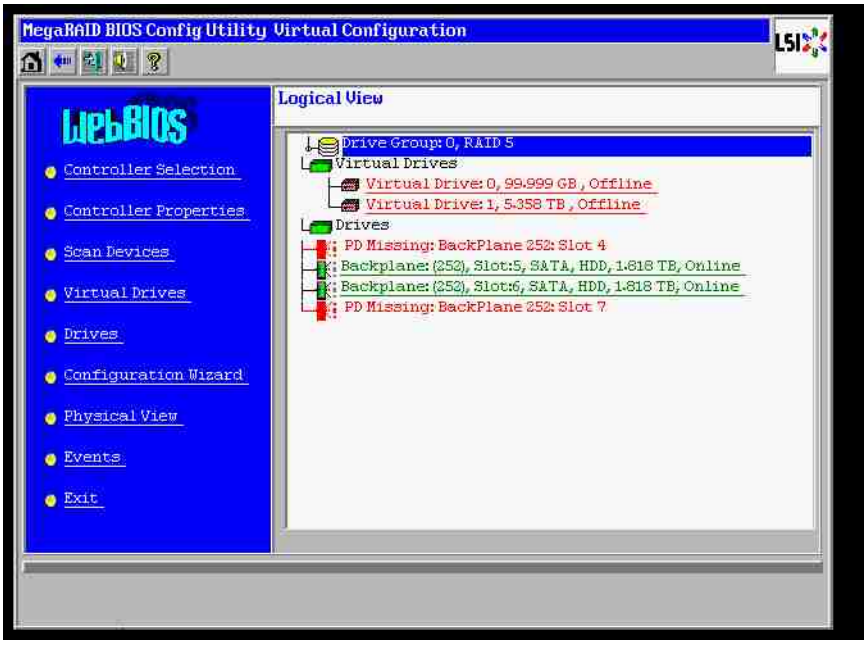
"Save Configuration" saves the new COD. "Initialize" deletes the Disk Data (OS).


MegaRAID BIOS Configuration Utility Confirm Page
Save this Configuration ?
No
Yes
MegaRAID BIOS Configuration Utility Confirm Page
All data on the new Virtual Disks will be lost. Want to Initialize?
No
Yes

The data area can only be deleted with a "fast" or "full" initialization; as long as an initialization is omitted, the OS file system is still there. But OS only boots, if the original RAID configuration is restored (if no multiple hardware damage exists).
If, for example, the RAID is deleted accidently (eg. with "clear" or "new configuration" instead of add),and the configuration is set up exactly (in disk order and stripesize) the same as before, the data area on the remaining operating system boots again without any problem. This fact is useful when the RAID (COD) was lost for some reason, but the disks are OK.

### 6.2.1 Multiple disks failed – theory

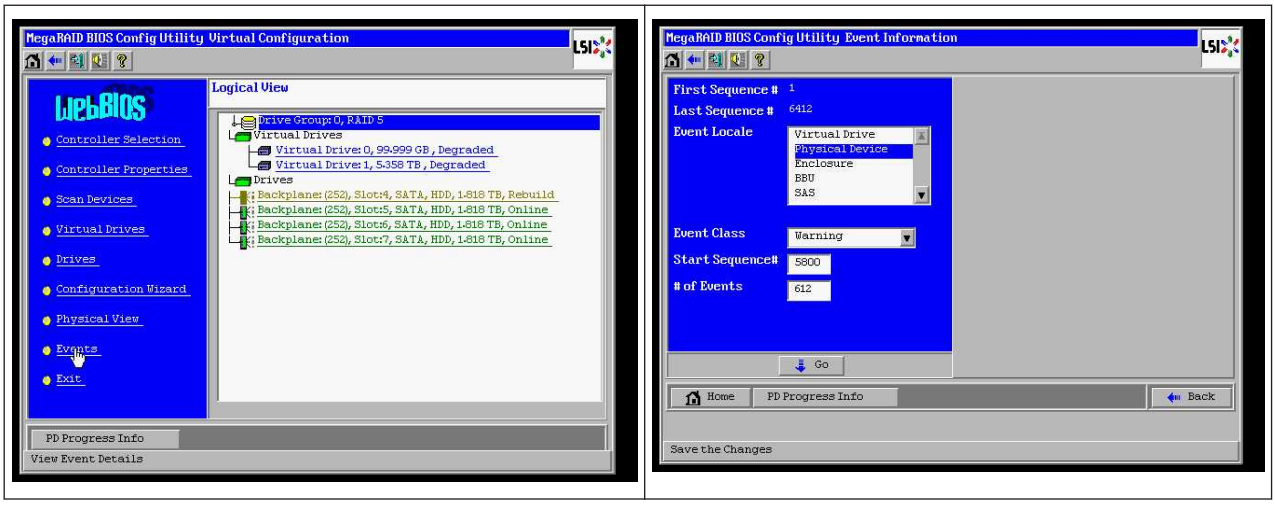
If multiple disks have failed (by power failure, backplane error, etc.), it is important to know the order, which disk failure degraded the RAID (first fail) and which disk ID prevented a further access to the RAID (second fail).
For instance:
RAID 5 (4 disks) got from rebuild to offline, no Hot Spare
- 2 disks online
- 2 disks missing
- 2 disks "foreign configuration" or "unconfigured good"



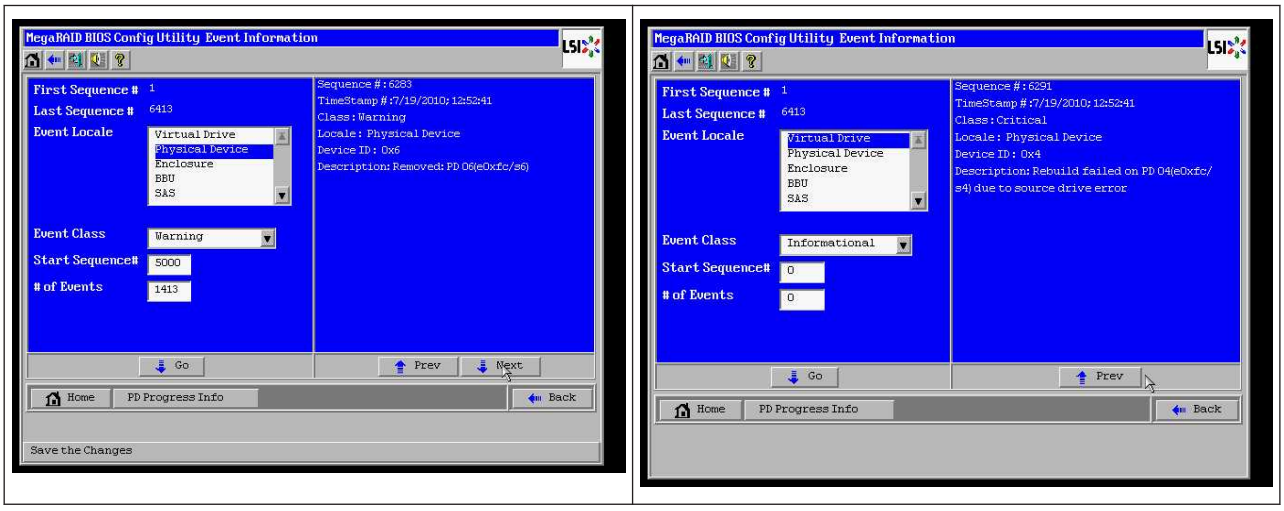

The rebuild only could start, when the other three disks were online before: the rebuild disk is "first fail", degraded RAID was rebuilding. "Foreign" disk is the "second fail" disk, one of the disks, from which the parity data was copied to the rebuilding disk before the crash.
If in "degraded" mode, the surviving disks was still used, a "parity – inconsistency" between the first failed (first fail) and the second failed disk occurs. But a RAID 5 is not usable when a second disk fails, so no inconsistency can exist.
If you try to restore the RAID, the first fail disk could be used for rebuild later (or a new disk). But the "second failed" disk must be used for hopefully get the offline RAID degraded again.
Two tools are useful to analyze what happened:
- the Event Viewer in the Controller Bios Utility
- the MegaCLI, a Command-Line Utility

**How to use the Event Viewer in the Controller Bios Utility**

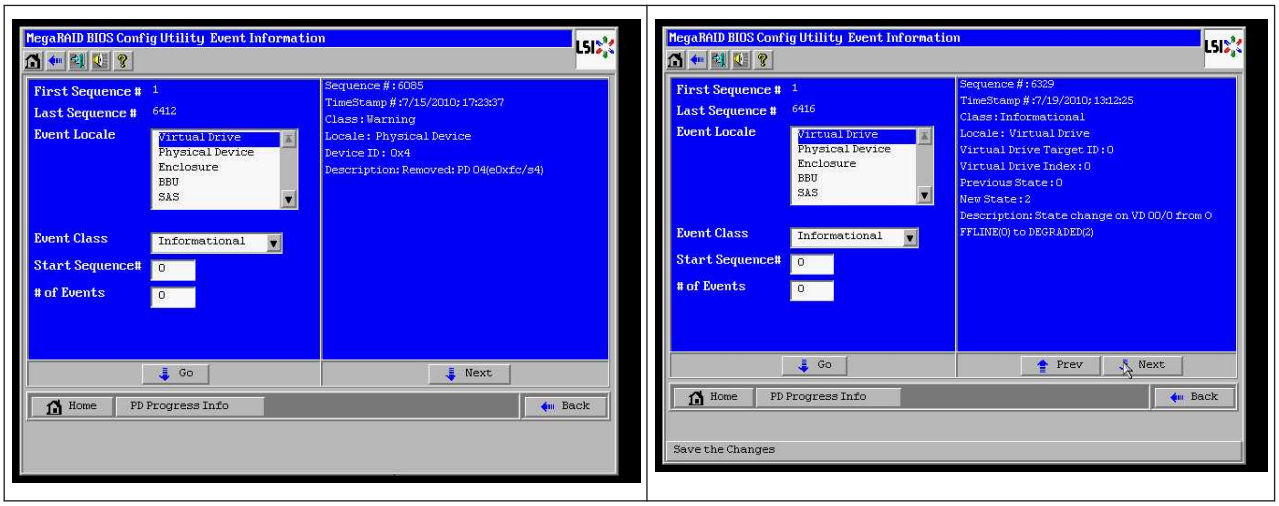
Click on an event in the main screen; choose "physical" or "virtual drive" and an event class (informational, warning, critical or fatal); start at an appropriate sequence number (minus a few hundred), choose the number of events.



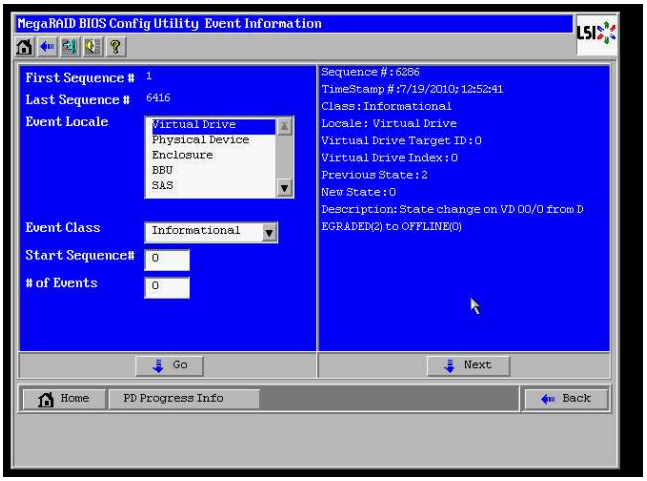

In this example, we choose a start sequence 5800 (from 6412) and all 612 events left. We find a timestamp, that PD (Physical Drive) 6 was removed. PD 4 stops rebuilding.

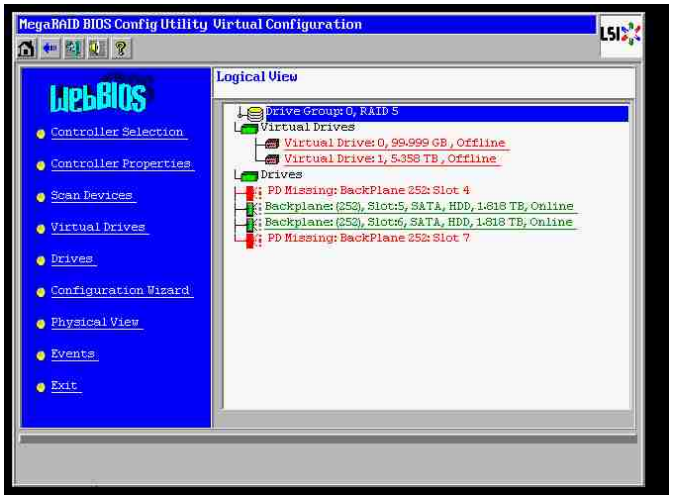



Finally, PD 4 is also removed.



The VD event reports first a degraded state, then an offline state. The "first failed" disk was the rebuilding PD4. When PD6 failed, the rebuild stopped, when PD4 was gone, RAID gets offline.



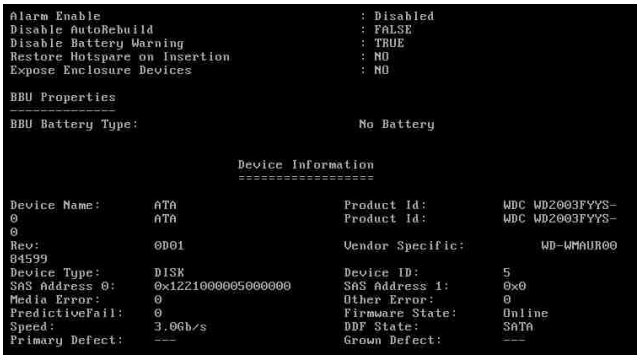




**How to use the MegaCLI Command-Line Utility**

Use a bootable DOS USB stick with XMS manager "himem.sys" and start the MegaCLI.exe. Please see the command reference in MegaCLI Commandline Utility.

The whole amount of log events can be seen with MegaCLI –AdpAliLog –aAll > evt.txt; but it takes a few minutes until the large file is written and it is too much information.

C:\LSIMEGA>MegaCli -AdpAllLog -aAll > evt.txt
DOS/32A -- Protected Mode Run-time Version 7.2
Copyright (C) Supernar Systems, Ltd. 1996-2002
C:\LSIMEGA>_


Alarm Enable : Disabled
Disable AutoRebuild : FALSE
Disable Battery Warning : TRUE
Restore Hotspare on Insertion : NO
Expose Enclosure Devices : NO
BBU Properties
BBU Battery Type: No Battery
Device Information
Device Name: ATA Product Id: WDC WD2003FYYS-
0 ATA Product Id: WDC WD2003FYYS-
0
Rev: 0D01 Vendor Specific: WD-WMAUR00
84599
Device Type: DISK Device ID: 5
SAS Address 0: 0x1221000005000000 SAS Address 1: 0x0
Media Error: 0 Other Error: 0
PredictiveFail: 0 Firmware State: Online
Speed: 3.0Gb/s DDF State: SATA
Primary Defect: --- Grown Defect: ---

For example, it is much better, to use this commands
(create with "-f ...txt" a file for analysis)

**MegaCli -AdpEventLog -GetEvents -warning -f warning.txt -aALL**

Adapter: 0 - Number of Events : 288

seqNum: 0x00001875
Time: Mon Jul 19 13:37:28 2010

Code: 0x00000124
Class: 1
Locale: 0x20
Event Description: Patrol Read can't be started, as PDs are either not ONLINE, or are in a VD with an active process, or are in an excluded VD
Event Data:

==========
None

seqNum: 0x0000188b
Time: Mon Jul 19 13:52:41 2010

Code: 0x00000070
Class: 1
Locale: 0x02
Event Description: Removed: PD 06(e0xfc/s6)
Event Data:
==========
Device ID: 6
Enclosure Index: 252
Slot Number: 6

**MegaCli -AdpEventLog -GetEvents -critical -f critical.txt -aALL**
Adapter: 0 - Number of Events : 288

seqNum: 0x00001893
Time: Mon Jul 19 13:52:41 2010

Code: 0x00000065
Class: 2
Locale: 0x02
Event Description: Rebuild failed on PD 04(e0xfc/s4) due to source drive error
Event Data:
==========
Device ID: 4
Enclosure Index: 252
Slot Number: 4

seqNum: 0x000018ba
Time: Mon Jul 19 14:12:25 2010

Code: 0x000000fb
Class: 2
Locale: 0x01
Event Description: VD 00/0 is now DEGRADED
Event Data:
==========
Target Id: 0

seqNum: 0x000018bc
Time: Mon Jul 19 14:12:25 2010

Code: 0x000000fb
Class: 2
Locale: 0x01
Event Description: VD 01/1 is now DEGRADED

Event Data:
==========
Target Id: 1

**Useful commands:**

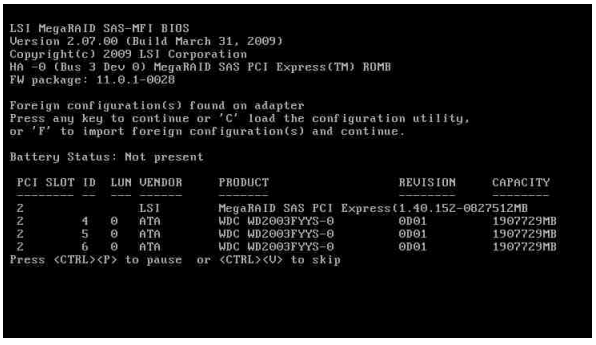
**MegaCli -AdpEventLog -GetEvents -info -f info.txt -aALL**
(but a large text file)

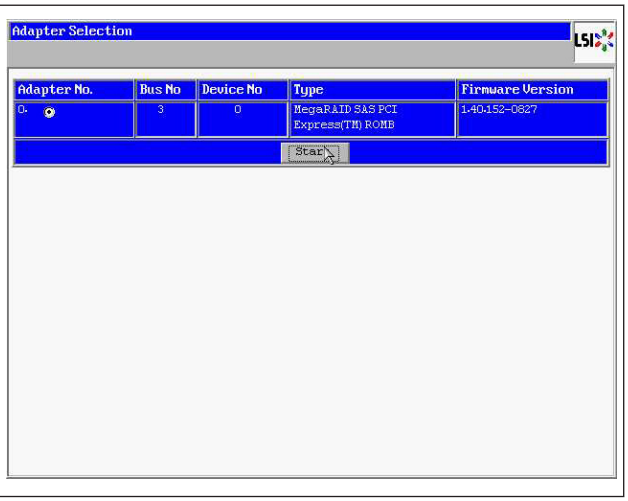
**MegaCli -AdpEventLog -GetEvents -fatal -f fatal.txt -aALL**

| | |
|---|---|
| Adapter: 0 - Number of Events : 288<br>seqNum: 0x0000188f<br>Time: Mon Jul 19 13:52:41 2010<br>Code: 0x000000fc<br>Class: 3<br>Locale: 0x01<br>Event Description: VD 00/0 is now OFFLINE<br>Event Data:<br>==========<br>Target Id: 0 | Adapter: 0 - Number of Events : 288<br>seqNum: 0x00001891<br>Time: Mon Jul 19 13:52:41 2010<br>Code: 0x000000fc<br>Class: 3<br>Locale: 0x01<br>Event Description: VD 01/1 is now OFFLINE<br>Event Data:<br>==========<br>Target Id: 1 |

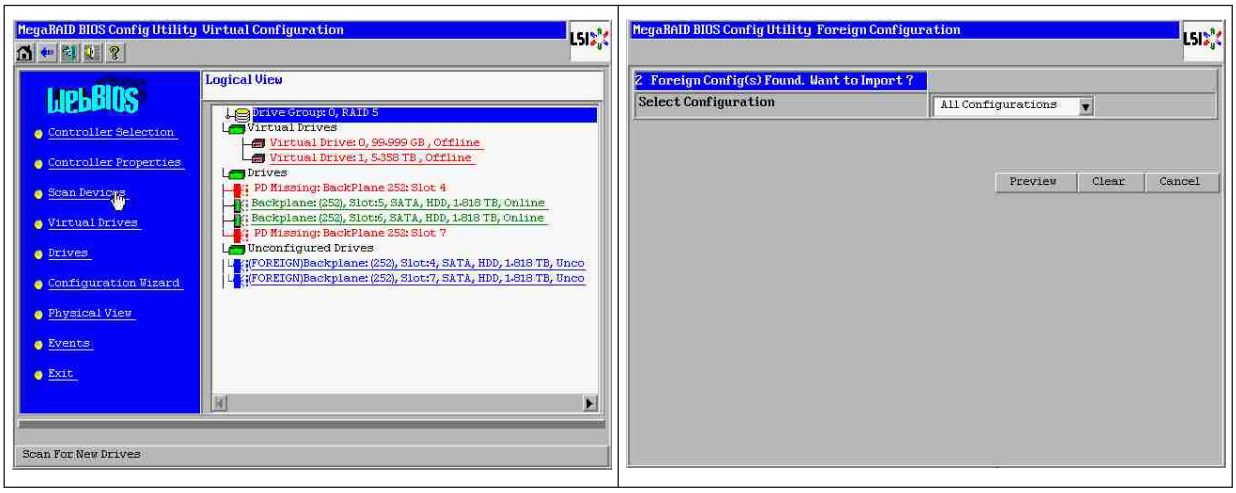
## 6.2.2 Multiple disks failed – practice

Press "C" to enter Utility. Click "start" and "scan disks".

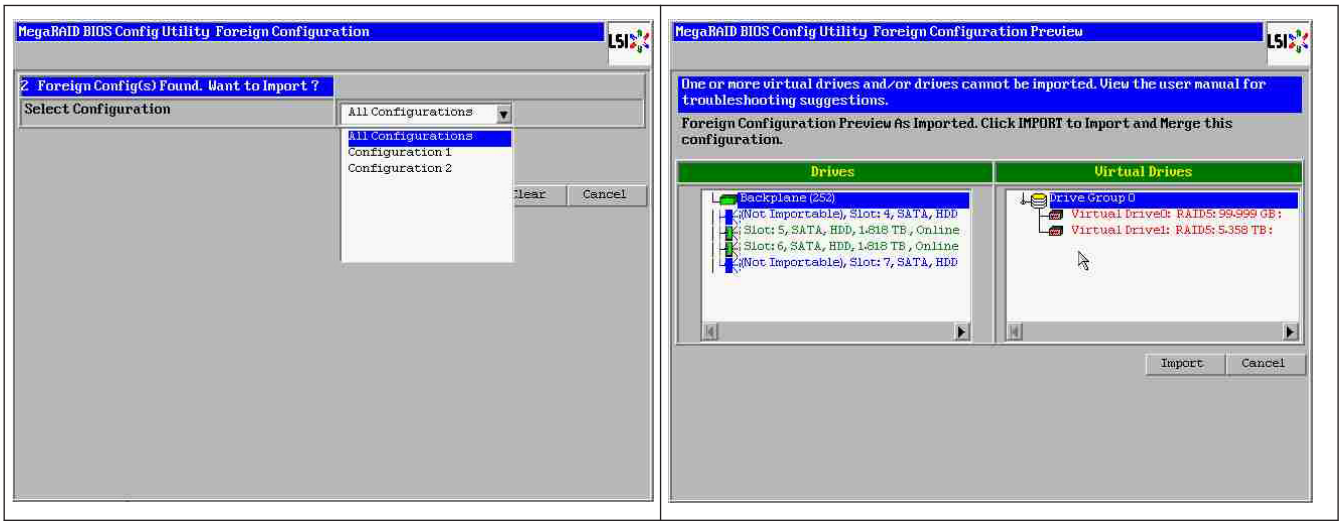

LSI MegaRAID SAS-MFI BIOS
Version 2.07.00 (Build March 31, 2009)
Copyright(c) 2009 LSI Corporation
HA -0 (Bus 3 Dev 0) MegaRAID SAS PCI Express(TM) ROMB
FW package: 11.0.1-0028
Foreign configuration(s) found on adapter
Press any key to continue or 'C' load the configuration utility,
or 'F' to import foreign configuration(s) and continue.
Battery Status: Not present
PCI SLOT ID LUN VENDOR PRODUCT REVISION CAPACITY
2 LSI MegaRAID SAS PCI Express(1.40.152-0827512MB
2 4 0 ATA WDC WD2003FYYS-0 0D01 1907729MB
2 5 0 ATA WDC WD2003FYYS-0 0D01 1907729MB
2 6 0 ATA WDC WD2003FYYS-0 0D01 1907729MB
Press <CTRL><P> to pause or <CTRL><U> to skip



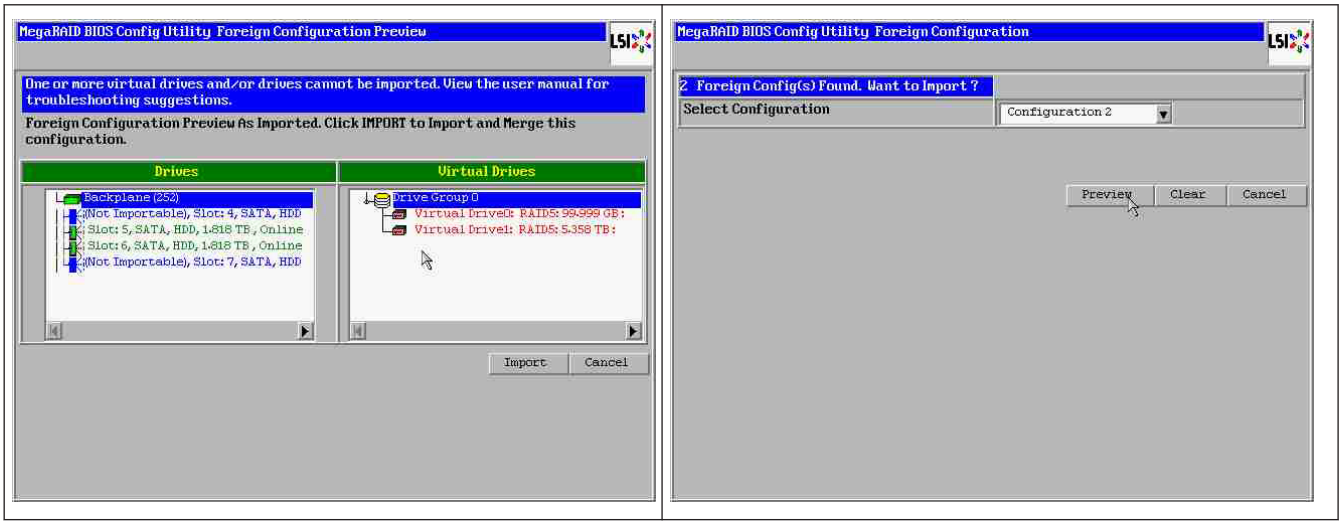

You get to the "foreign configuration import" screen.



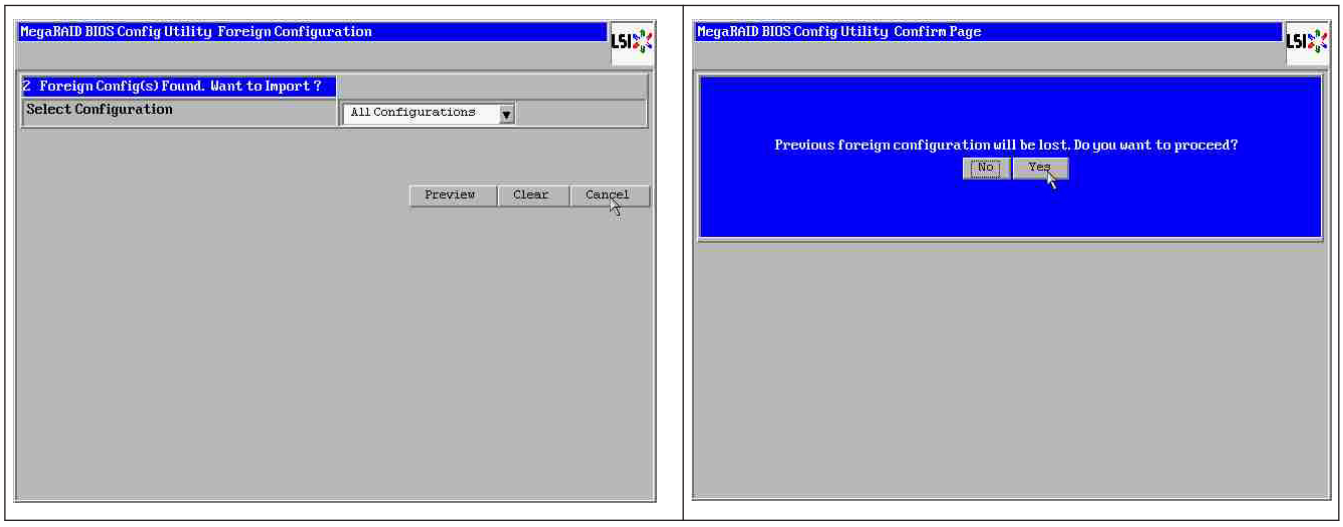

Select one of the two configurations and click **Preview**.


MegaRAID BIOS Config Utility Foreign Configuration
2 Foreign Config(s) Found. Want to Import ?
Select Configuration
All Configurations
All Configurations
Configuration 1
Configuration 2
Cancel
MegaRAID BIOS Config Utility Foreign Configuration Preview
One or more virtual drives and/or drives cannot be imported. View the user manual for troubleshooting suggestions.
Foreign Configuration Preview As Imported. Click IMPORT to Import and Merge this configuration.
Drives
Virtual Drives
Backplane (252)
(Not Importable), Slot: 4, SATA, HDD
Slot: 5, SATA, HDD, 1.818 TB , Online
Slot: 6, SATA, HDD, 1.818 TB , Online
(Not Importable), Slot: 7, SATA, HDD
Drive Group 0
Virtual Drive0: RAID5: 99.999 GB :
Virtual Drive1: RAID5: 5.358 TB :
Import
Cancel

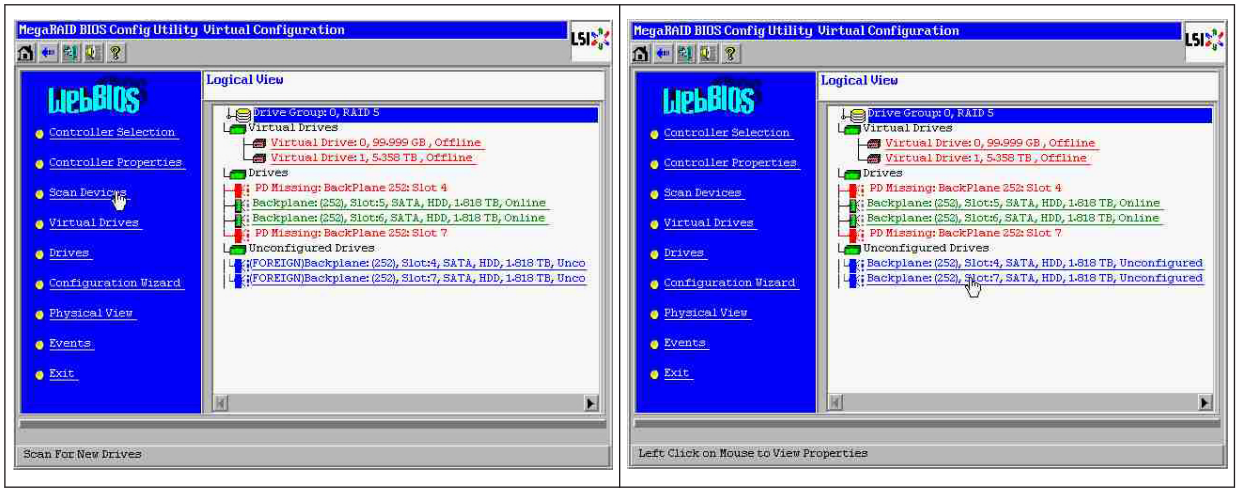
All disks are seen, but configuration is marked as not importable; click **Cancel** and view Configuration 2. It is the same; this means, a complex situation requires manual interaction.


MegaRAID BIOS Config Utility Foreign Configuration Preview
One or more virtual drives and/or drives cannot be imported. View the user manual for troubleshooting suggestions.
Foreign Configuration Preview As Imported. Click IMPORT to Import and Merge this configuration.
Drives
Virtual Drives
Backplane (252)
(Not Importable), Slot: 4, SATA, HDD
Slot: 5, SATA, HDD, 1.818 TB , Online
Slot: 6, SATA, HDD, 1.818 TB , Online
(Not Importable), Slot: 7, SATA, HDD
Drive Group 0
Virtual Drive0: RAID5: 99.999 GB :
Virtual Drive1: RAID5: 5.358 TB :
Import
Cancel
MegaRAID BIOS Config Utility Foreign Configuration
2 Foreign Config(s) Found. Want to Import ?
Select Configuration
Configuration 2
Preview
Clear
Cancel

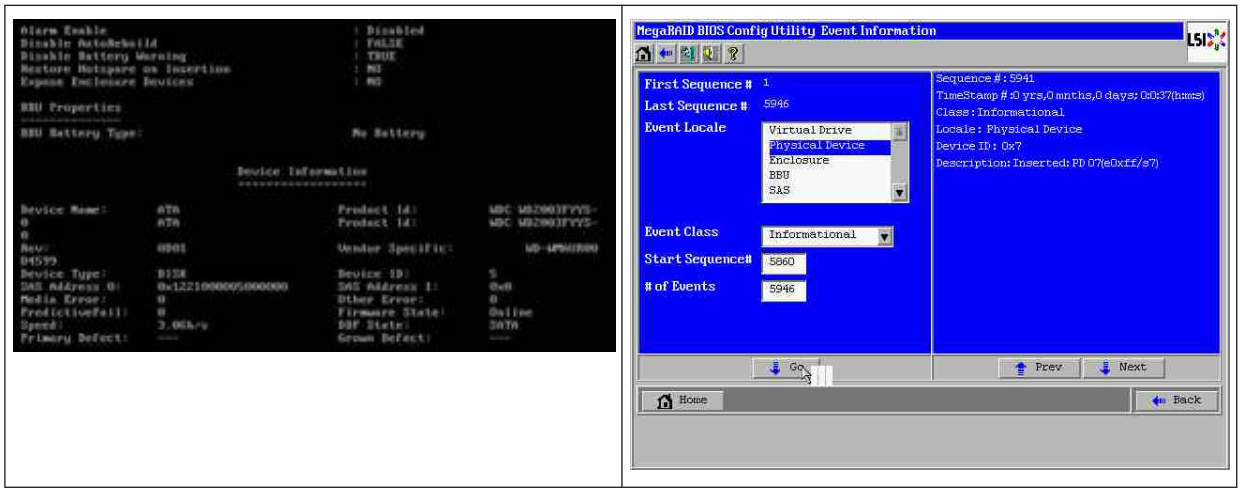
Click to clear all configurations, ignore the warning.



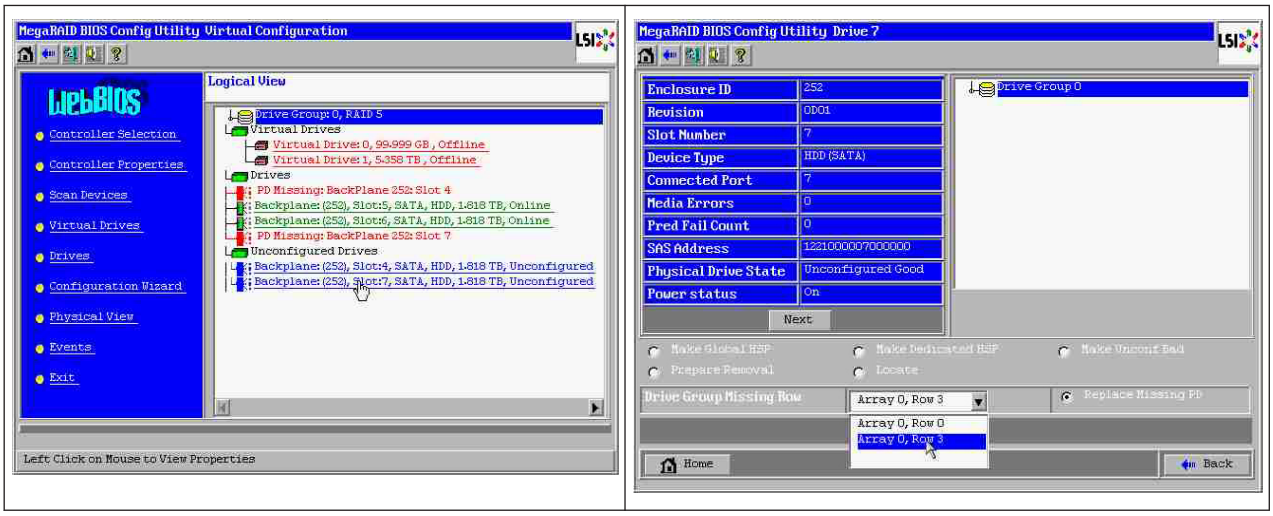

Before clear foreign configuration, 2 disks were missing, two were foreign. After clear, the foreign disks now are shown as unconfigured.



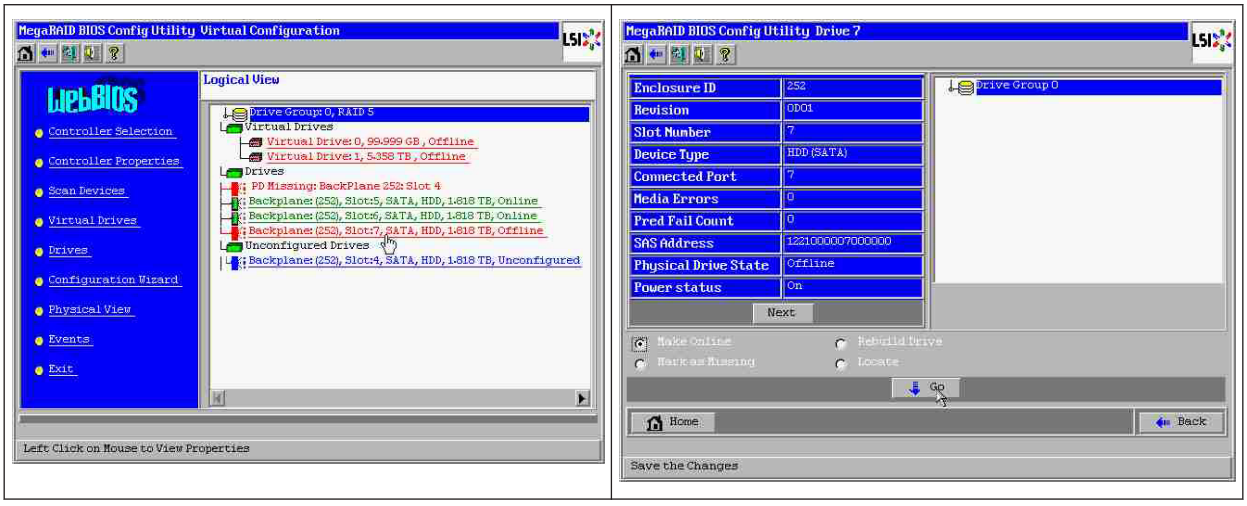

Use the event viewer or MegaCLI to identify the "first failed" disk.



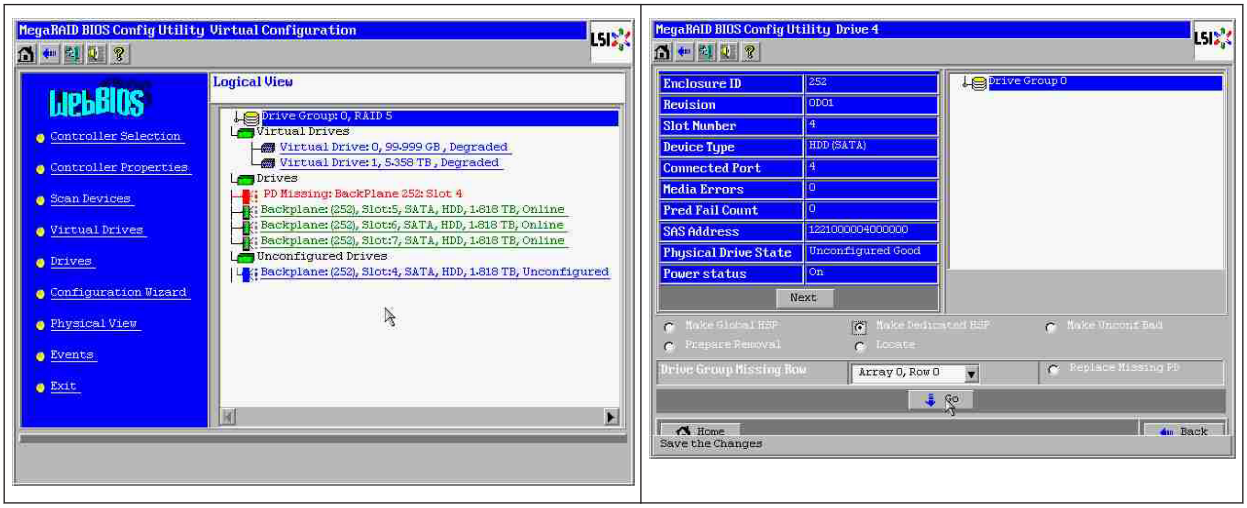

In this example, disk in Slot 4 was first fail, Slot 7 second fail. Click on "second fail" PD7 in the Logical View and you get in the Physical drive menu. Choose "replace missing PD" and the correct row for Slot 7 drive and click "go". Ignore the warning.



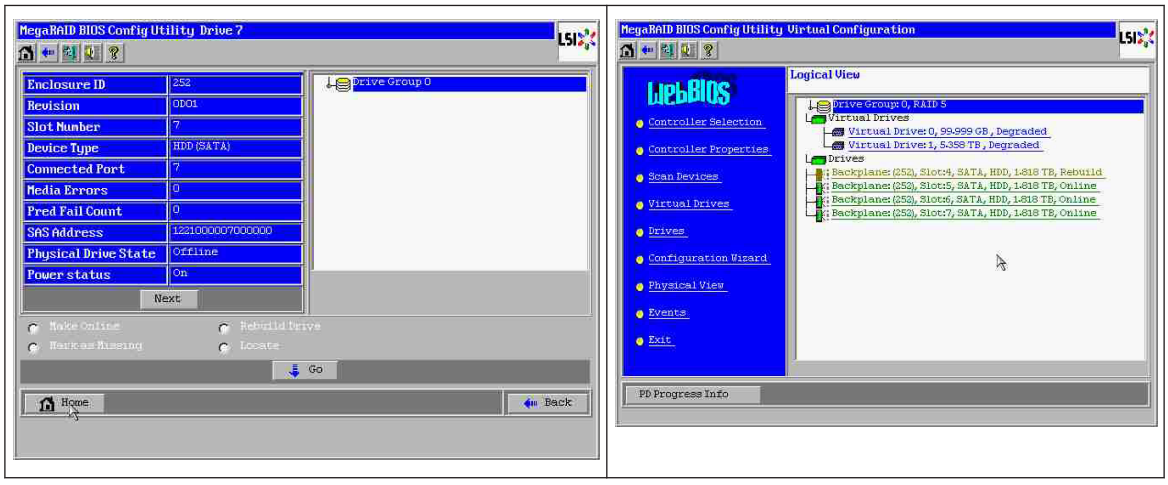

Now in Logical View we see this disk marked as offline; click on the disk to get in PD menu. Click on "Make online" and "go".




Now in logical view we see disk online and a degraded RAID. Click on disk 4 to get in the PD menu. Click on correct row, on "Global" or "dedicated Hot Spare" and on "go".

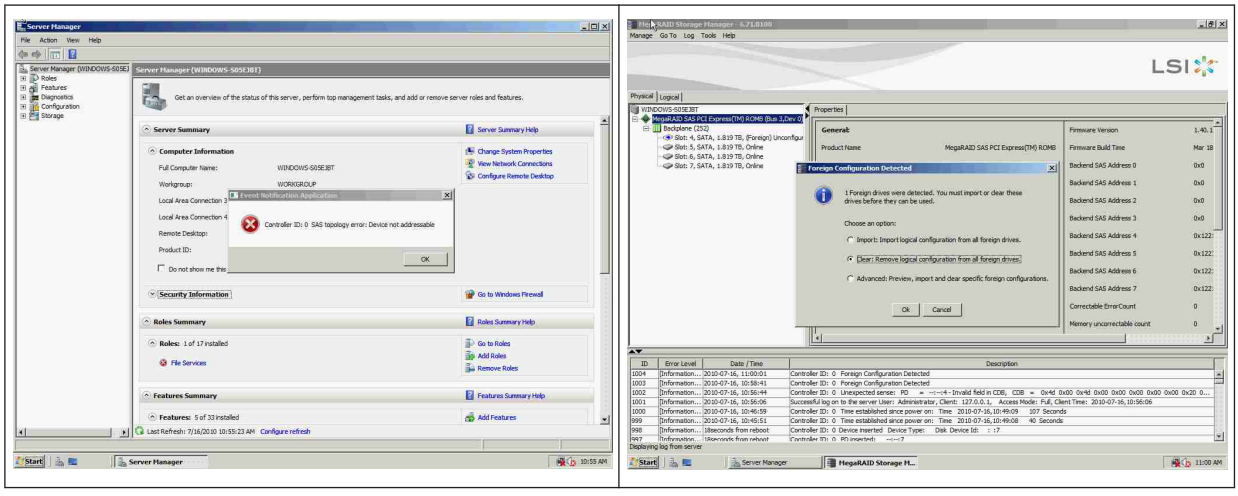



Click on home; in the Logical View, the rebuild is starting.

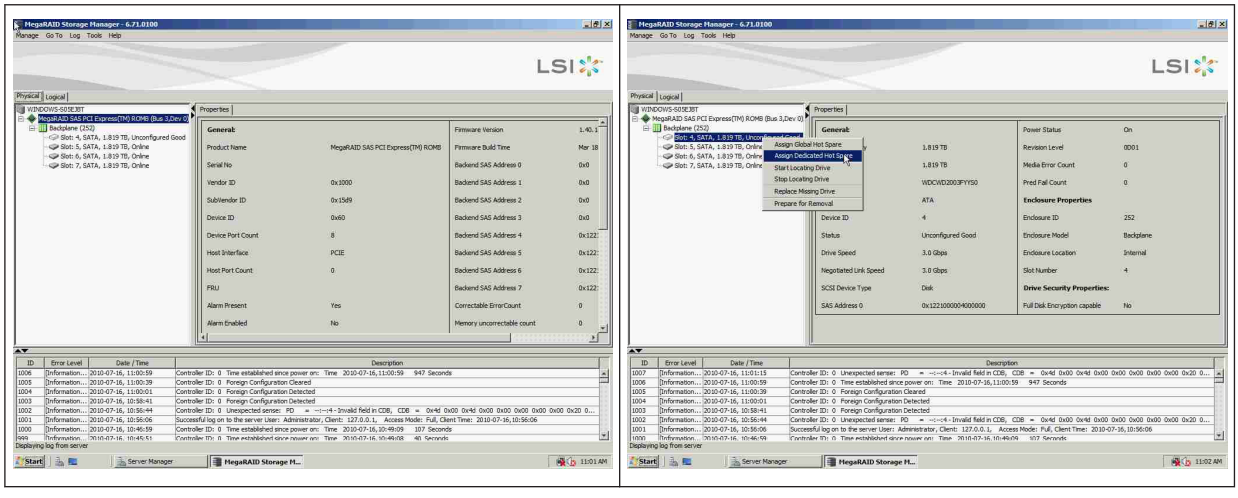



## 6.2.3 Foreign configuration disk appears in the Windows GUI after booting

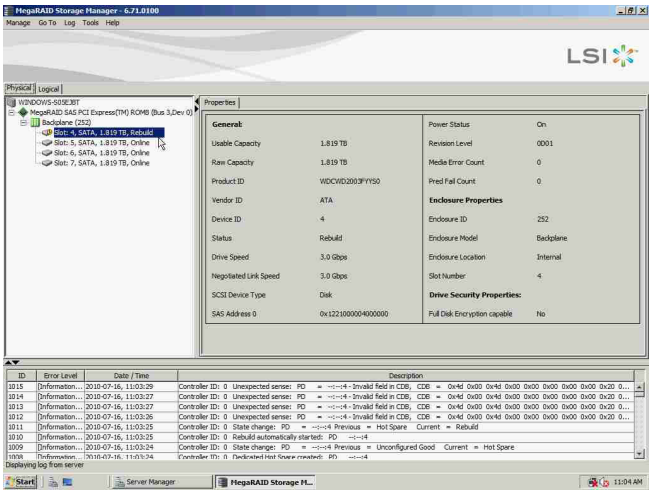
The RAID is degraded. Topology error is shown. Right-click Megaraid Controller in the MSM GUI. Click "scan foreign configuration". In the next window, click "clear foreign configuration".


Server Manager
Foreign Configuration Detected
Clear: Remove logical configuration from all foreign drives.
Import: Import logical configuration from all foreign drives.
Advanced: Preview, import and clear specific foreign configurations.

An unconfigured good drive is displayed. Right-click this drive and choose a hotspare type.




You see the rebuild is starting at once.




## 6.2.4 MegaCLI Commandline Utility

[-Silent] [-AppLogFile filename] [-NoLog] [-page [N]]
[-] is optional.
N - Number of lines per page.

MegaCli -v
MegaCli -help|-h|?
MegaCli -adpCount
MegaCli -AdpSetProp {CacheFlushInterval -val} | { RebuildRate -val}
| {PatrolReadRate -val} | {BgiRate -val} | {CCRate -val}
| {ReconRate -val} | {SpinupDriveCount -val} | {SpinupDelay -val}
| {CoercionMode -val} | {ClusterEnable -val} | {PredFailPollInterval -val}
| {BatWarnDsbl -val} | {EccBucketSize -val} | {EccBucketLeakRate -val}
| {AbortCCOnError -val} | AlarmEnbl | AlarmDsbl | AlarmSilence
| {SMARTCpyBkEnbl -val} | {SSDSMARTCpyBkEnbl -val} | NCQEnbl | NCQDsbl
| {MaintainPdFailHistoryEnbl -val} | {RstrHotSpareOnInsert -val}
| {EnblSpinDownUnConfigDrvs -val} | {EnblSSDPatrolRead -val}
| {DisableOCR -val} | {BootWithPinnedCache -val}
| AutoEnhancedImportEnbl | AutoEnhancedImportDsbl -aN|-a0,1,2|-aALL
| {ExposeEnclDevicesEnbl -val} -aN|-a0,1,2|-aALL
| {DsblSpinDownHsp -val} -aN|-a0,1,2|-aALL
| {SpinDownTime -val} -aN|-a0,1,2|-aALL
MegaCli -AdpSetProp -AutoDetectBackPlaneDsbl -val -aN|-a0,1,2|-aALL
val - 0=Enable Auto Detect of SGPIO and i2c SEP.
1=Disable Auto Detect of SGPIO.
2=Disable Auto Detect of i2c SEP.
3=Disable Auto Detect of SGPIO and i2c SEP.
MegaCli -AdpSetProp -CopyBackDsbl -val -aN|-a0,1,2|-aALL
val - 0=Enable Copyback.
1=Disable Copyback.
MegaCli -AdpSetProp -EnableJBOD -val -aN|-a0,1,2|-aALL
val - 0=Disable JBOD mode.
1=Enable JBOD mode.
MegaCli -AdpSetProp -DsblCacheBypass -val -aN|-a0,1,2|-aALL
val - 0=Enable Cache Bypass.

1=Disable Cache Bypass.
MegaCli -AdpSetProp -LoadBalanceMode -val -aN|-a0,1,2|-aALL
val - 0=Auto Load balance mode.
1=Disable Load balance mode.
MegaCli -AdpSetProp -UseFDEOnlyEncrypt -val -aN|-a0,1,2|-aALL
val - 0=FDE and controller encryption (if HW supports) is allowed.
1=Only support FDE encryption, disallow controller encryption.
MegaCli -AdpSetProp -PrCorrectUncfgdAreas -val -aN|-a0,1,2|-aALL
val - 0= Correcting Media error during PR is disabled.
1=Correcting Media error during PR is allowed.
MegaCli -AdpSetProp -DsblSpinDownHSP -val -aN|-a0,1,2|-aALL
val - 0= Spinning down the Hot Spare is enabled.
1=Spinning down the Hot Spare is disabled.
MegaCli -AdpGetProp CacheFlushInterval | RebuildRate | PatrolReadRate
| BgiRate | CCRate | ReconRate | SpinupDriveCount | SpinupDelay
| CoercionMode | ClusterEnable | PredFailPollInterval | BatWarnDsbl
| EccBucketSize | EccBucketLeakRate | EccBucketCount | AbortCCOnError
| AlarmDsply | SMARTCpyBkEnbl | SSDSMARTCpyBkEnbl | NCQDsply
| MaintainPdFailHistoryEnbl | RstrHotSpareOnInsert
| EnblSpinDownUnConfigDrvs | EnblSSDPatrolRead | DisableOCR
| BootWithPinnedCache | AutoEnhancedImportDsply | AutoDetectBackPlaneDsbl
| CopyBackDsbl | LoadBalanceMode | UseFDEOnlyEncrypt | WBSupport | EnableJBOD
| DsblCacheBypass | ExposeEnclDevicesEnbl | DsblSpinDownHsp | SpinDownTime
| PrCorrectUncfgdAreas -aN|-a0,1,2|-aALL
| DsblSpinDownHSP -aN|-a0,1,2|-aALL
MegaCli -AdpAllInfo -aN|-a0,1,2|-aALL
MegaCli -AdpGetTime -aN|-a0,1,2|-aALL
MegaCli -AdpSetTime yyyymmdd hh:mm:ss -aN
MegaCli -AdpSetVerify -f fileName -aN|-a0,1,2|-aALL
MegaCli -AdpBIOS -Enbl |-Dsbl | -SOE | -BE | -Dsply -aN|-a0,1,2|-aALL
MegaCli -AdpBootDrive {-Set {-Lx | -physdrv[E0:S0]}}|-Get -aN|-a0,1,2|-aALL
MegaCli -AdpAutoRbld -Enbl|-Dsbl|-Dsply -aN|-a0,1,2|-aALL
MegaCli -AdpCacheFlush -aN|-a0,1,2|-aALL
MegaCli -AdpPR -Dsbl|EnblAuto|EnblMan|Start|Stop|Info| SSDPatrolReadEnbl |
SSDPatrolReadDsbl
|{SetDelay Val}|{-SetStartTime yyyymmdd hh}|{maxConcurrentPD Val} -aN|-a0,1,2|-aALL
MegaCli -AdpCcSched -Dsbl|-Info|{-ModeConc | -ModeSeq [-ExcludeLD -LN|-L0,1,2]
[-SetStartTime yyyymmdd hh ] [-SetDelay val ] } -aN|-a0,1,2|-aALL
MegaCli -AdpCcSched -SetStartTime yyyymmdd hh -aN|-a0,1,2|-aALL
MegaCli -AdpCcSched -SetDelay val -aN|-a0,1,2|-aALL
MegaCli -FwTermLog -BBUoff|BBUoffTemp|BBUon|Dsply|Clear -aN|-a0,1,2|-aALL
MegaCli -AdpAllLog -aN|-a0,1,2|-aALL
MegaCli -AdpDiag [val] -aN|-a0,1,2|-aALL
val - Time in second.
MegaCli -AdpBatTest -aN|-a0,1,2|-aALL
MegaCli -PDList -aN|-a0,1,2|-aALL
MegaCli -PDGetNum -aN|-a0,1,2|-aALL
MegaCli -pdInfo -PhysDrv[E0:S0,E1:S1,...] -aN|-a0,1,2|-aALL
MegaCli -PDOnline -PhysDrv[E0:S0,E1:S1,...] -aN|-a0,1,2|-aALL
MegaCli -PDOffline -PhysDrv[E0:S0,E1:S1,...] -aN|-a0,1,2|-aALL

MegaCli -PDMakeGood -PhysDrv[E0:S0,E1:S1,...] | [-Force] -aN|-a0,1,2|-aALL
MegaCli -PDMakeJBOD -PhysDrv[E0:S0,E1:S1,...] -aN|-a0,1,2|-aALL
MegaCli -PDHSP {-Set [-Dedicated [-ArrayN|-Array0,1,2...]] [-EnclAffinity] [-nonRevertible]}
|-Rmv -PhysDrv[E0:S0,E1:S1,...] -aN|-a0,1,2|-aALL
MegaCli -PDRbld -Start|-Stop|-ShowProg |-ProgDsply
-PhysDrv [E0:S0,E1:S1,...] -aN|-a0,1,2|-aALL
MegaCli -PDClear -Start|-Stop|-ShowProg |-ProgDsply
-PhysDrv [E0:S0,E1:S1,...] -aN|-a0,1,2|-aALL
MegaCli -PdLocate {[-Start] | -stop } -physdrv[E0:S0,E1:S1,...] -aN|-a0,1,2|-aALL
MegaCli -PdMarkMissing -physdrv[E0:S0,E1:S1,...] -aN|-a0,1,2|-aALL
MegaCli -PdGetMissing -aN|-a0,1,2|-aALL
MegaCli -PdReplaceMissing -physdrv[E0:S0] -arrayA, -rowB -aN
MegaCli -PdPrpRmv [-UnDo] -physdrv[E0:S0] -aN|-a0,1,2|-aALL
MegaCli -EncInfo -aN|-a0,1,2|-aALL
MegaCli -EncStatus -aN|-a0,1,2|-aALL
MegaCli -PhyInfo -phyM -aN|-a0,1,2|-aALL
MegaCli -LDInfo -Lx|-L0,1,2|-LaII -aN|-a0,1,2|-aALL
MegaCli -LDSetProp {-Name LdNamestring} | -RW|RO|Blocked | WT|WB [-Immediate]|RA|NORA|
ADRA
| Cached|Direct | -EnDskCache|DisDskCache | CachedBadBBU|NoCachedBadBBU
-Lx|-L0,1,2|-LaII -aN|-a0,1,2|-aALL
MegaCli -LDGetProp -Cache | -Access | -Name | -DskCache -Lx|-L0,1,2|-LALL
-aN|-a0,1,2|-aALL
MegaCli -getLdExpansionInfo -Lx|-L0,1,2|-LaII -aN|-a0,1,2|-aALL
MegaCli -LdExpansion -pN -dontExpandArray -Lx|-L0,1,2|-LaII -aN|-a0,1,2|-aALL
MegaCli -LDInit {-Start [-full]}|-Abort|-ShowProg|-ProgDsply -Lx|-L0,1,2|-LALL -aN|-a0,1,2|-aALL
MegaCli -LDCC {-Start [-force]}|-Abort|-ShowProg|-ProgDsply -Lx|-L0,1,2|-LALL -aN|-a0,1,2|-
aALL
MegaCli -LDBI -Enbl|-Dsbl|-getSetting|-Abort|-ShowProg|-ProgDsply -Lx|-L0,1,2|-LALL -aN|-
a0,1,2|-aALL
MegaCli -LDRecon {-Start -rX [{-Add | -Rmv} -Physdrv[E0:S0,...]]}|-ShowProg|-ProgDsply
-Lx -aN
MegaCli -LdPdInfo -aN|-a0,1,2|-aALL
MegaCli -LDGetNum -aN|-a0,1,2|-aALL
MegaCli -LDBBMClr -Lx|-L0,1,2,...|-LaII -aN|-a0,1,2|-aALL
MegaCli -CfgLdAdd -rX[E0:S0,E1:S1,...] [WT|WB] [NORA|RA|ADRA] [Direct|Cached]
[CachedBadBBU|NoCachedBadBBU] [-szXXX [-szYYY ...]]
[-strpszM] [-Hsp[E0:S0,...]] [-AfterLdX] [-Force]|[FDE|CtrlBased] -aN
MegaCli -CfgSscdAdd -Physdrv[E0:S0,...] {-Name LdNamestring} -aN|-a0,1,2|-aALL
MegaCli -CfgEachDskRaid0 [WT|WB] [NORA|RA|ADRA] [Direct|Cached]
[CachedBadBBU|NoCachedBadBBU] [-strpszM]|[FDE|CtrlBased] -aN|-a0,1,2|-aALL
MegaCli -CfgClr -aN|-a0,1,2|-aALL
MegaCli -CfgDsply -aN|-a0,1,2|-aALL
MegaCli -CfgLdDel -LX|-L0,2,5...|-LALL -aN|-a0,1,2|-aALL
MegaCli -CfgSscdDel -LX|-L0,2,5...|-LALL -aN|-a0,1,2|-aALL
MegaCli -CfgFreeSpaceinfo -aN|-a0,1,2|-aALL
MegaCli -CfgSpanAdd -r10 -Array0[E0:S0,E1:S1] -Array1[E0:S0,E1:S1] [-
ArrayX[E0:S0,E1:S1] ...] -aN
MegaCli -CfgSpanAdd -r50 -Array0[E0:S0,E1:S1,E2:S2,...] -Array1[E0:S0,E1:S1,E2:S2,...]
[-ArrayX[E0:S0,E1:S1,E2:S2,...] ...] [WT|WB] [NORA|RA|ADRA] [Direct|Cached]

[CachedBadBBU|NoCachedBadBBU][-strpszM][-szXXX[-szYYY ...]][-AfterLdX]|
[FDE|CtrlBased] -aN
MegaCli -CfgAllFreeDrv -rX [-SATAOnly] [-SpanCount XXX] [WT|WB] [NORA|RA|ADRA]
[Direct|Cached] [CachedBadBBU|NoCachedBadBBU] [-strpszM]
[-HspCount XX [-HspType -Dedicated|-EnclAffinity|-nonRevertible]] |
[FDE|CtrlBased] -aN
MegaCli -CfgSave -f filename -aN
MegaCli -CfgRestore -f filename -aN
MegaCli -CfgForeign -Scan | [-SecurityKey sssssssssss] -aN|-a0,1,2|-aALL
MegaCli -CfgForeign -Dsply [x] | [-SecurityKey sssssssssss] -aN|-a0,1,2|-aALL
MegaCli -CfgForeign -Preview [x] | [-SecurityKey sssssssssss] -aN|-a0,1,2|-aALL
MegaCli -CfgForeign -Import [x] | [-SecurityKey sssssssssss] -aN|-a0,1,2|-aALL
MegaCli -CfgForeign -Clear [x]|[-SecurityKey sssssssssss] -aN|-a0,1,2|-aALL
x - index of foreign configurations. Optional. All by default.
MegaCli -AdpEventLog -GetEventLogInfo -aN|-a0,1,2|-aALL
MegaCli -AdpEventLog -GetEvents {-info -warning -critical -fatal} {-f <fileName>} -aN|-a0,1,2|-aALL
MegaCli -AdpEventLog -GetSinceShutdown {-info -warning -critical -fatal} {-f <fileName>} -aN|-a0,1,2|-aALL
MegaCli -AdpEventLog -GetSinceReboot {-info -warning -critical -fatal} {-f <fileName>} -aN|-a0,1,2|-aALL
MegaCli -AdpEventLog -IncludeDeleted {-info -warning -critical -fatal} {-f <fileName>} -aN|-a0,1,2|-aALL
MegaCli -AdpEventLog -GetLatest n {-info -warning -critical -fatal} {-f <fileName>} -aN|-a0,1,2|-aALL
MegaCli -AdpEventLog -GetCCIncon -f <fileName> -LX|-L0,2,5...|-LALL -aN|-a0,1,2|-aALL
MegaCli -AdpEventLog -Clear -aN|-a0,1,2|-aALL
MegaCli -AdpBbuCmd -aN|-a0,1,2|-aALL
MegaCli -AdpBbuCmd -GetBbuStatus -aN|-a0,1,2|-aALL
MegaCli -AdpBbuCmd -GetBbuCapacityInfo -aN|-a0,1,2|-aALL
MegaCli -AdpBbuCmd -GetBbuDesignInfo -aN|-a0,1,2|-aALL
MegaCli -AdpBbuCmd -GetBbuProperties -aN|-a0,1,2|-aALL
MegaCli -AdpBbuCmd -BbuLearn -aN|-a0,1,2|-aALL
MegaCli -AdpBbuCmd -BbuMfgSleep -aN|-a0,1,2|-aALL
MegaCli -AdpBbuCmd -BbuMfgSeal -aN|-a0,1,2|-aALL
MegaCli -AdpBbuCmd -SetBbuProperties -f <fileName> -aN|-a0,1,2|-aALL
MegaCli -AdpFacDefSet -aN
MegaCli -AdpM0Flash -f filename
MegaCli -AdpGetConnectorMode -ConnectorN|-Connector0,1|-ConnectorAll -aN|-a0,1,2|-aALL
MegaCli -AdpSetConnectorMode -Internal|-External|-Auto -ConnectorN|-Connector0,1|-ConnectorAll -aN|-a0,1,2|-aALL
MegaCli -PhyErrorCounters -aN|-a0,1,2|-aALL
MegaCli -DirectPdMapping -Enbl|-Dsbl|-Dsply -aN|-a0,1,2|-aALL
MegaCli -ShowEnclList -aN|-a0,1,2|-aALL
MegaCli -ShowVpd -Page N -Encl N -aN|-a0,1,2|-aALL
MegaCli -EnclLocate -Start|-Stop -Encl N -aN|-a0,1,2|-aALL
MegaCli -EnclFwDownload -Encl N -Esm A|B -f <filename> -aN|-a0,1,2|-aALL
MegaCli -PdFwDownload [-SataBridge] -PhysDrv[0:1,1:2,...] -f <filename> -aN|-a0,1,2|-aALL
MegaCli -SetFacDefault -Encl N -Esm A|B -f <filename> -aN|-a0,1,2|-aALL
MegaCli -PDCpyBk -Start -PhysDrv[E0:S0,E1:S1] -aN|-a0,1,2|-aALL

MegaCli -PDCpyBk -Stop|-ShowProg|-ProgDsply -PhysDrv[E0:S0] -aN|-a0,1,2|-aALL
MegaCli -PDInstantSecureErase -PhysDrv[E0:S0,E1:S1,...] | [-Force] -aN|-a0,1,2|-aALL
MegaCli -LDMakeSecure -Lx|-L0,1,2,...|-Lall -aN|-a0,1,2|-aALL
MegaCli -DestroySecurityKey | [-Force] -aN
MegaCli -CreateSecurityKey -SecurityKey sssssssssss | [-Passphrase sssssssssss] |[-KeyID kkkkkkkkkkk] -aN
MegaCli -ChangeSecurityKey -OldSecurityKey sssssssssss | -SecurityKey sssssssssss| [-Passphrase sssssssssss] | [-KeyID kkkkkkkkkkk] -aN
MegaCli -GetKeyID [-PhysDrv[E0:S0]] -aN
MegaCli -SetKeyID -KeyID kkkkkkkkkkk -aN
MegaCli -VerifySecurityKey -SecurityKey sssssssssss -aN

sssssssssss - It must be between eight and thirty-two
characters and contain at least one number,
one lowercase letter, one uppercase
letter and one non-alphanumeric character.
kkkkkkkkkkk - Must be less than 256 characters.
MegaCli -GetPreservedCacheList -aN|-a0,1,2|-aALL
MegaCli -DiscardPreservedCache -Lx|-L0,1,2|-Lall -aN|-a0,1,2|-aALL
MegaCli -AdpInfoCompare {-checkFw <string> | -checkID -hex | -checkBatt -val | -checkDimm -val} -aN|-a0,1,2|-aALL
MegaCli -adpFwDump
MegaCli -AdpNameRtn -aN|-a0,1,2|-aALL

sssssssssss - It must be between eight and thirty-two
characters and contain at least one number,
one lowercase letter, one uppercase
letter and one non-alphanumeric character.
kkkkkkkkkkk - Must be less than 256 characters.
MegaCli -ShowSummary [-f filename] -aN

Note: The directly connected drives can be specified as [:S]

Wildcard '?' can be used to specify the enclosure ID for the drive in the only enclosure without direct connected device or the direct connected drives with no enclosure in the system.

Note:[-aALL] option assumes that the parameters specified are valid for all the Adapters.

The following options may be given at the end of any command above:

[-Silent] [-AppLogFile filename] [-NoLog] [-page [N]]
[-] is optional.
N - Number of lines per page.

Exit Code: 0x00

# 7 Additional documentation and client software

**Documentation for Bosch Security System products can be found as follows:**

- www.boschsecurity.com > select your region and your country > select **Product Catalog** > start a search for your product > select the product in the search results to show the existing documents.

**And on the following network share:**

- \\<IP address of DIVAR IP>\sources

# 8 Appendices

This chapter gives information for supporting and troubleshooting.

## 8.1 Motherboard

All graphics shown in this chapter were based upon the latest PCB Revision available at the time of publishing of the manual. The motherboard you've received can differ from the graphics shown in this chapter.

### 8.1.1 Motherboard layout

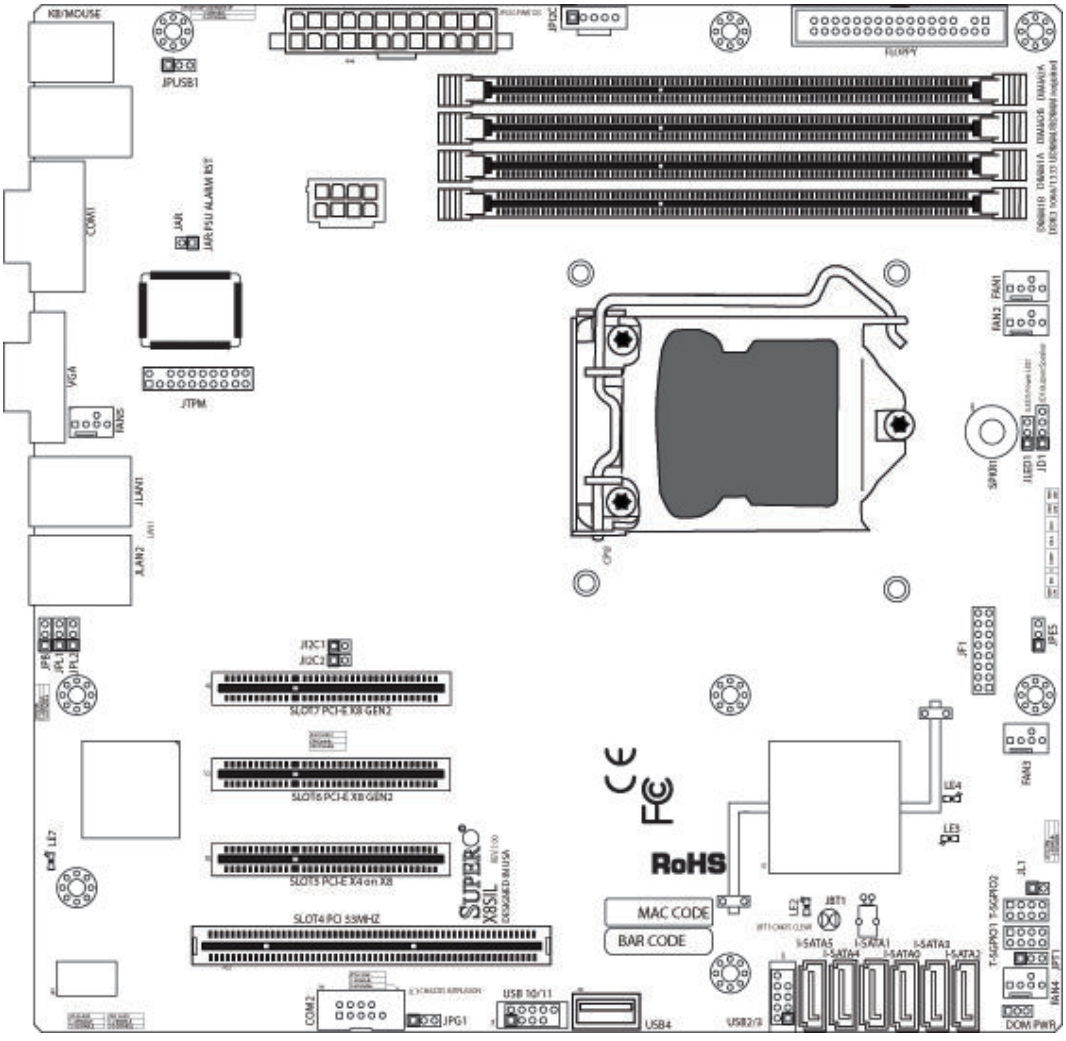



**Figure 8.1: Motherboard layout**

**Important notes to the user:**

- Jumpers not indicated are for testing only.
- When LE2 (Onboard Power LED Indicator) is on, system power is on. Unplug the power cable before installing or removing any components.
- All systems have a SATA DOM connected to Serial ATA ports (I-SATA-5) with a small power connector (DOM PWR).
- SATA-DOM: Is plugged in connector I-SATA-5 on the motherboard.

## 8.1.2 Motherboard component overview

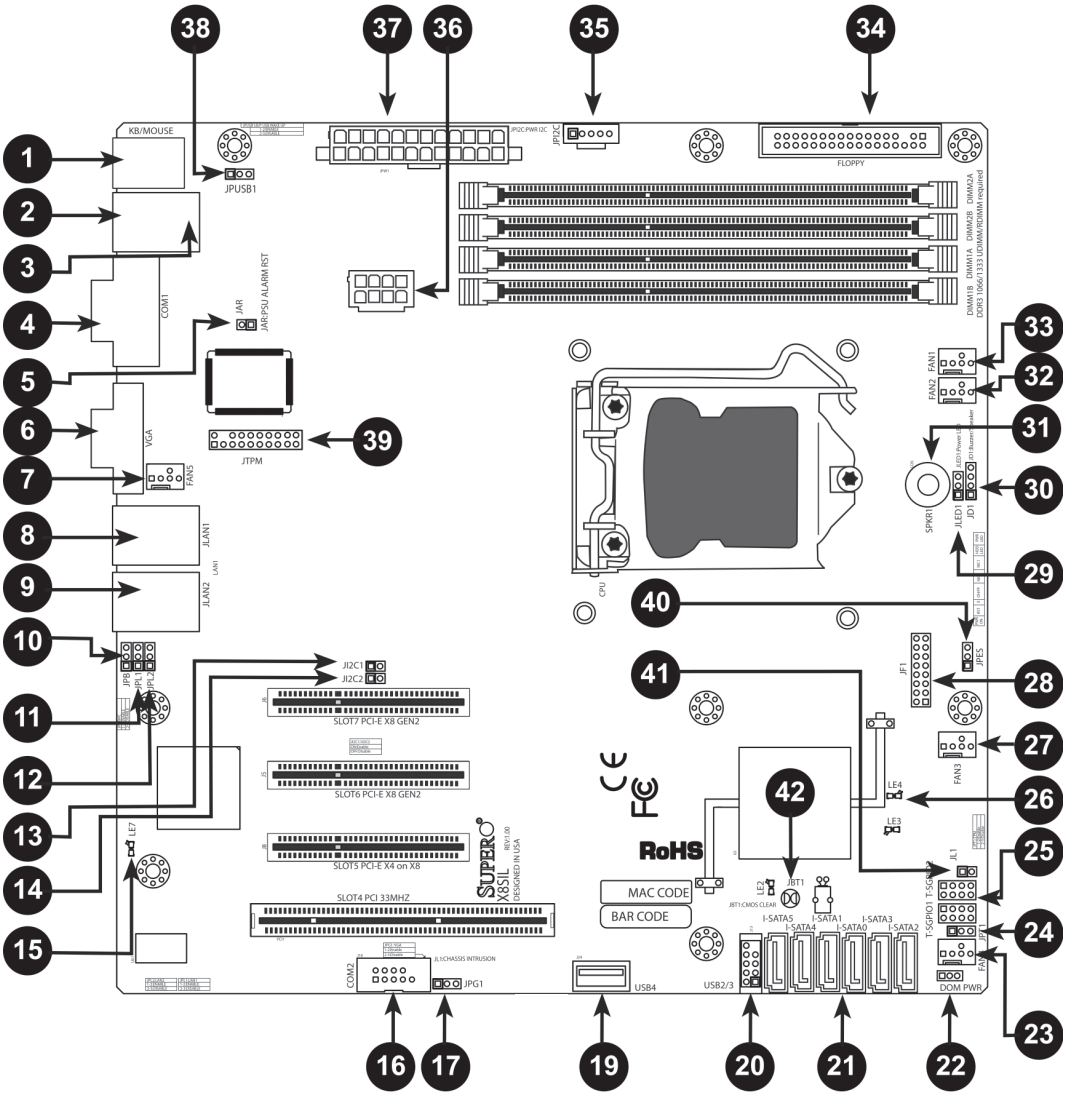



**Figure 8.2: Motherboard – component overview**

### X8SIL/X8SIL-F/X8SIL-V jumpers

| Number | Jumper | Description | Default |
|---|---|---|---|
| 38 | JPUSB1 | BP USB0/1 Wake-up | Pins 1-2 (Enabled) |
| 42 | JBT1 | CMOS Clear | |
| 40 | JPES | Energy Saving Feature | Pins 2-3 (Disabled) |
| 13,14 | JI2C1/JI2C2 | SMB to PCI Slots | |
| 17 | JPG1 | Onboard VGA Enable | Pins 1-2 (Enabled) |
| 11,12 | JPL1/JPL2 | LAN1/LAN2 Enable | Pins 1-2 (Enabled) |
| 24 | JPT1 | TPM Enable | Pins 1-2 (Enabled) |
| 10 | JPB | BMC Jumper | Pins 1-2 (Enabled) |

**X8SIL/X8SIL-F/X8SIL-V headers/connectors**

| Number | Connector | Description |
|---|---|---|
| 4,16 | COM1/COM2 | COM1/2 Serial connection headers |
| 33,32,27,23,7 | Fans 1~5 | System/CPU fan headers |
| 34 | Floppy | Floppy Disk Drive connector |
| 5 | JAR | Alarm Reset |
| 30 | JD1 | Speaker header (Pins 3/4: Internal, 1~4:External) |
| 28 | JF1 | Front Panel Control header |
| 41 | JL1 | Chassis Intrusion header |
| 29 | JLED | Power LED Indicator header |
| 37 | JPW1 | 24-pin ATX main power connector (required) |
| 36 | JPW2 | +12V 8-pin CPU power connector (required) |
| 1 | KB/Mouse | Keyboard/mouse connectors |
| 8,9 | LAN1~LAN2, | Gigabit Ethernet (RJ45) ports (LAN1/LAN2) |
| 21 | I-SATA 0~5 | Serial ATA ports (X8SIL has 4 Serial ATA Ports) |
| 2 | IPMI | IPMI LAN Port (X8SIL-F Only) |
| 35 | JPI2C | PWR supply (I2C) System Management Bus |
| 31 | SPKR1 | Internal speaker/buzzer |
| 25 | T-SGPIO-0/1 | Serial General Purpose IO headers (for SATA) |
| 3,20 | USB0/1 | Backplane USB 0/1 |
| 19 | USB 4 | Type A USB Connector |
| 18 | USB 10/11 | Front Panel USB header (X8SIL-F Only) |
| 22 | DOM PWR | Disk-On-Module (DOM) Power Connector |
| 39 | JTPM | Trusted Platform Module (TPM) Header |
| 6 | VGA | Onboard Video Port |

**X8SIL/X8SIL-F/X8SIL-V LED indicators**

| Number | LED | Description | Color/State | Status |
|---|---|---|---|---|
| 26 | LE4 | Onboard Standby PWR LED Indicator | Green: Solid on | PWR On |
| 15 | LE7 | IPMI Heartbeat LED (X8SIL-F Only) | Yellow: Blinking | IPMI: Normal |

### 8.1.3 Motherboard features

| | | |
|---|---|---|
| CPU | Single Intel Xeon 3400 series processor in an LGA1156 socket. | |
| Memory | Four (4) 240-pin, DDR3 SDRAM DIMM sockets with support for up to 16GB of UDIMM or up to 32GB of RDIMM memory (ECC/ DDR3 1333/1066/800 MHz memory only.) | |
| | Supports dual-channel memory bus | |
| | DIMM sizes | |
| | UDIMM | 1 GB, 2 GB, and 4GB |
| | RDIMM | 1 GB, 2GB, 4GB, and 8GB |
| Chipset | Intel 3420 Chipset (X8SIL-F/X8SIL-V) | |
| | Intel 3400 Chipset (X8SIL) | |
| Expansion Slots | Two (2) PCI Express 2.0 (x8) slot | |
| | One (1) PCI Express x4 (x8) slot | |
| | One (1) 32-bit PCI 33MHz slot | |
| Integrated Graphics | Matrox G200eW | |
| Network Connections | Two Intel 82574L Gigabit (10/100/1000 Mb/s) Ethernet Controllers for LAN 1 and LAN 2 ports. | |
| | Two (2) RJ-45 Rear IO Panel Connectors with Link and Activity LEDs | |
| | Single Realtek RTL8201N PHY to support IPMI 2.0 (X8SIL-F Only) | |
| I/O Devices | SATA Connections (X8SIL-F/X8SIL-V Only) | |
| | SATA Ports | Six (6) |
| | RAID (Windows) | RAID 0, 1, 5, 10 |
| | RAID (Linux) | RAID 0, 1, 10 |
| | SATA Connections (X8SIL Only) | |
| | SATA Ports | Four (4) |
| | Integrated IPMI 2.0 (X8SIL-F Only) | |
| | IPMI 2.0 supported by the WPCM450 Server BMC | |
| | Floppy Disk Drive | |
| | One (1) floppy drive interface (up to 1.44 MB) | |
| | USB Devices (X8SIL Only) | |
| | Two (2) USB ports on the rear IO panel | |
| | One (1) Type A internal connector | |
| I/O Devices (Continued) | USB Devices (X8SIL-F/X8SIL-V Only) | |

| | |
|---|---|
| | Two (2) USB ports on the rear IO panel |
| | Four (4) USB header connectors for front access |
| | One (1) Type A internal connector |
| | Keyboard/Mouse |
| | PS/2 Keyboard/Mouse ports on the I/O backplane |
| | Serial (COM) Ports |
| | Two (2) Fast UART 16550 Connections: one 9-pin RS-232 port and one header |
| | Super I/O |
| | Winbond Super I/O 83627DHG-P |
| BIOS | 32 Mb SPI AMI BIOS SM Flash BIOS |
| | DMI 2.3, PCI 2.3, ACPI 1.0/2.0/3.0, USB Keyboard and SMBIOS 2.5 |
| Power Configuration | ACPI/ACPM Power Management |
| | Main switch override mechanism |
| | Keyboard Wake-up from Soft-Off |
| | Internal/External moder ring-on |
| | Power-on mode for AC power recovery |
| PC Health Monitoring | CPU Monitoring |
| | Onboard voltage monitors for CPU core, +3.3V, +5V, +/-12V, +3.3V Stdby, +5V Stdby, VBAT, HT, Memory, Chipset |
| | CPU 3-Phase switching voltage regulator |
| | CPU/System overheat LED and control |
| | CPU Thermal Trip support |
| | Thermal Monitor 2 (TM2) support |
| | Fan Control |
| | Fan status monitoring with firmware 4-pin (Pulse Width Modulation) fan speed control |
| | Low noise fan speed control |
| System Management | PECI (Platform Environment Configuration Interface) 2.0 support |
| | System resource alert via Supero Doctor III |
| | SuperoDoctor III, Watch Dog, NMI |
| | Chassis Intrusion Header and Detection |
| CD Utilities | BIOS flash upgrade utility |

| | |
|---|---|
| | Drivers and software for Intel 3400/3420 chipset utilities |
| Other | ROHS 6/6 (Full Compliance, Lead Free) |
| Dimensions | Micro ATX form factor, 9.6" x 9.6" |

### 8.1.4 Block diagram

The following graphic shows the block diagram of the motherboard.

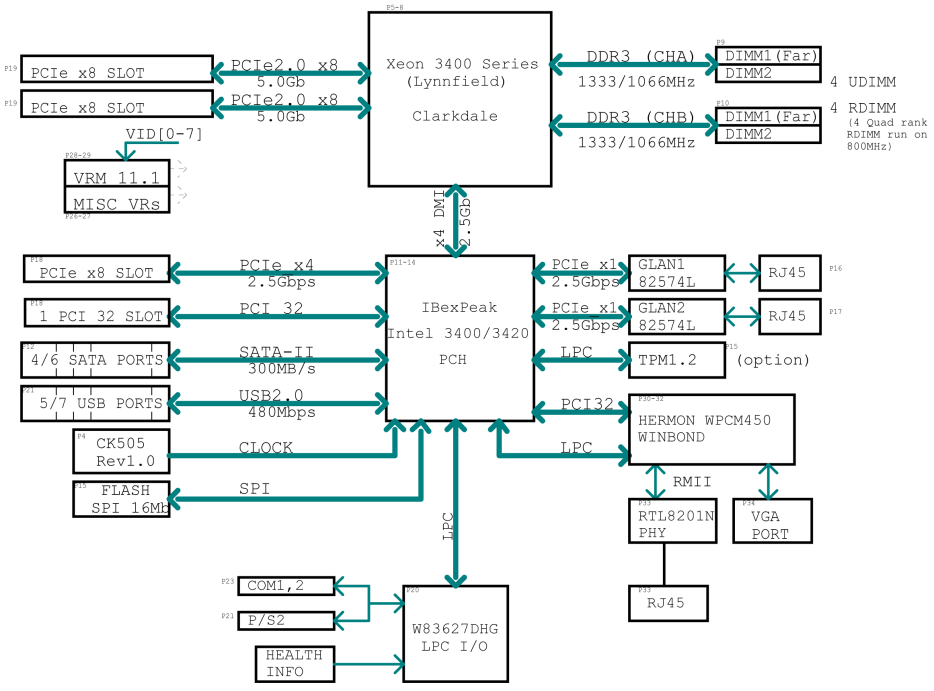



**Figure 8.3: Block diagram**

**Notice!**

This is a general block diagram and may not exactly represent the features on your motherboard. See the Motherboard Features pages for the actual specifications of each motherboard.

## 8.2 Chipset overview

The X8SIL/X8SIL-F/X8SIL-V supports the Intel Xeon 3400 processor series. Built upon the functionality and the capability of the single-chip Intel 3400 chipset, the X8SIL/X8SIL-F/X8SIL-V motherboard provides the performance and feature set required for single-processor-based systems with configuration options optimized for entry-level server platforms.The high-speed Direct Media Interface (DMI) featured in the Intel 3400/3420 chipset enables the X8SIL/X8SIL-F/X8SIL-V motherboard to offer a high-speed Direct Media Interface (DMI) for chip-to-chip true isochronous communication with the processor. This feature allows the X8SIL/X8SIL-F/X8SIL-V to achieve up to 10 Gb/s of software-transparent data transfer on each direction, achieving

better performance than comparable systems. The X8SIL/X8SIL-F/X8SIL-V also features a TCO timer (to enable the system to recover from a software/hardware lock), ECC Error Reporting, Function Disable and Intruder Detect.

**Intel 3400/3420 chipset features**

- Direct Media Interface (up 10 Gb/s transfer, Full Duplex)
- Intel Matrix Storage Technology and Intel Rapid Storage Technology
- Dual NAND Interface
- Intel I/O Virtualization (VT-d) Support
- Intel Trusted Execution Technology Support
- PCI Express 2.0 Interface (up to 5.0 GT/s)
- SATA Controller (up to 3G/s)
- Advanced Host Controller Interface (AHCI)

## 8.3 PC health monitoring

This section describes the PC health monitoring features of the X8SIL/X8SIL-F/X8SIL-V. These features are supported by an onboard System Hardware Monitor chip.

**Recovery from AC power loss**

BIOS provides a setting for you to determine how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must hit the power switch to turn it back on) or for it to automatically return to a power on state. The default setting is Last State.

**Onboard voltage monitoring**

The onboard voltage monitor will scan the following voltages continuously: CPU core, +3.3V, +5V, +/-12V, +3.3V Stdby, +5V Stdby, VBAT, HT, Memory, Chipset. Once a voltage becomes unstable, it will give a warning or send an error message to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor by using SD III.

**Fan status monitor with software**

PC health monitoring can check the RPM status of the cooling fans via Supero Doctor III.

**CPU overheat LED and control**

This feature is available when the user enables the CPU overheat warning feature in the BIOS. This allows the user to define an overheat temperature. When this temperature reaches this pre-defined overheat threshold, the CPU thermal trip feature will be activated and it will send a signal to the buzzer and, at the same time, the CPU speed will be decreased.

## 8.4 Power configuration settings

This section describes the features of your motherboard that deal with power and power settings.

**Slow blinking LED for suspend-state indicator**

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in the suspend mode. When the user presses any key, the CPU will wake-up and the LED indicator will automatically stop blinking and remain on.

**BIOS support for USB keyboard**

If the USB keyboard is the only keyboard in the system, it will function like a normal keyboard during system boot-up.

**Main switch override mechanism**

When an ATX power supply is used, the power button can function as a system suspend button. When the user presses the power button, the system will enter a SoftOff state. The monitor will be suspended and the hard drive will spin down. Pressing the power button again to wake-up the whole system. During the SoftOff state, the ATX power supply provides power

the system to keep the required circuitry "alive". In case the system malfunctions and you want to turn off the power, just press and hold the power button for 4 seconds. The power will turn off and no power will be provided to the motherboard.

## 8.5 Power supply

A stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates of 1 GHz and faster.
The X8SIL/X8SIL-F/X8SIL-V accommodates ATX12V standard power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. A 2-Amp of current supply on a 5V Standby rail is strongly recommended.
It is strongly recommended that you use a high quality power supply that meets ATX12V standard power supply Specification 1.1 or later. It is also required that the 12V 8-pin power connection (JPW2) be used for adequate power supply. In areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.
DIVAR IP 7000 does not have a function to determine pre-failure of a power supply. The power supply will have the LED to show it is “OK” or “failed” by showing the color green or amber for the respective status. When the power supply fails, it shows amber, when it is functioning correctly it shows green.

## 8.6 Super I/O

The disk drive adapter functions of the Super I/O chip include a floppy disk drive controller that is compatible with industry standard 82077/765, a data separator, write pre-compensation circuitry, decode logic, data rate selection, a clock generator, drive interface control logic and interrupt and DMA logic. The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives. The Super I/O supports two 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s.
It also provides two high-speed, 16550-compatible serial communication ports (UARTs). Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.
The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through a SMI or SCI function pin. It also features auto power management to reduce power consumption.

## 8.7 iSCSI support

The X8SIL/X8SIL-F/X8SIL-V motherboard supports the iSCSI Internet Protocol. iSCSI is an IP networking standard used to link and manage data storage, and transfer data across the internet and private intranets through long distance. iSCSI can be used to transmit data over local area networks (LANs), wide area networks (WANs), or the Internet. It can enable location-independent data storage and retrieval.
iSCSI allow clients to issue SCSI commands to remote SCSI storage devices and allow data centers to consolidate remote storage devices into storage arrays, giving an illusion of locally-attached disks to host servers. Unlike fiber-optic networks that require special cabling, iSCSI can run over long distance using existing networks.

For the X8SIL/X8SIL-F/X8SIL-V motherboard, iSCSI is supported on LAN 1. This can be enabled through the BIOS: Advanced => PCI/PnP Configuration => Onboard LAN1 Option ROM Select.

## 8.8 Overview of the Nuvoton BMC controller

The Nuvoton WPCM150 is a combined Baseboard Management Controller and 2D/VGA-compatible Graphics Core with PCI interface, Virtual Media and Keyboard, and a Keyboard/Video/Mouse Redirection (KVMR) module.
The WPCM150 interfaces with the host system via a PCI interface to communicate with the Graphics core. It supports USB 2.0 and 1.1 for remote keyboard/mouse/virtual media emulation. It also provides an LPC interface to control Super I/O functions and connects to the network via an external Ethernet PHY module or shared NCSI connections.
The Nuvoton BMC communicates with onboard components via six SMBus interfaces, fan control, Platform Environment Control Interface (PECI) buses, and General Purpose I/O (T-SGPIO) ports.
It also includes the following features:

– One X-Bus parallel interface for expansion I/O connections
– Three ADC inputs, Analog and Digital Video outputs
– Two serial for boundary scan and debug

There are two different versions of the Nuvoton BMC chip that are used in this product series. The Nuvoton WPCM150 (Manufacturer P/N WPCM150GA0BX5) which includes all of the features above, is the chip installed in the X8SIL motherboard. Another version, the Nuvoton WPCM450 (Manufacturer P/N WPCM450RA0BX) also has all the features as described above plus IPMI 2.0 support. This particular chip is installed in the X8SIL-F and X8SIL-V models. However, IPMI is supported only on the X8SIL-F motherboard.

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